DECEMBER 7, 1959

PURCHASING

The Methods and News Magazine for Industrial Buyers

A New Approach to Make or Buy

page 69

You're Never Too Small to Save

page 73

Cut Costs With Push-Button P.O.'s

page 75

How Purchasing Can Help R & D

page 80

A CONOVER-MAST PUBLICATION SEVENTY-FIVE CENTS

Table of Contents . . . . . Page 5

Wherever your customers buy MACOMA...



Its performance and name are the same around the world

Other Outstanding Shell Industrial Lubricants

Shell Tellus Oils—for hydraulic systems

Shell Alvania Grease—multi-purpose industrial grease

Shell Turbo Oils—for utility, industrial and marine turbines

Shell Rimula Oils—for heavy-duty diesel engines

Shell Talona R Oil 40—anti-wear crankcase oil for diesel locomotives

Shell Dromus Oils—soluble cutting oils for high-production metalworking

Shell Voluta Oils—for high-speed quenching with maximum stability

Shell Macoma Oils are available world-wide . . . assurance that your customers abroad will get the same performance from your equipment that your domestic customers rely upon.

Macoma® Oils are premium quality, fortified extreme pressure industrial gear oils. They provide superior high-load-carrying capacity and are particularly effective where overloading, severe shock-loading or general heavy-duty conditions exist.

Macoma Oils have these added built-in benefits: excellent resistance to oxidation, great adhesiveness, rapid separation from water. They are non-corrosive, non-foaming and have high stability in storage.

For more information, write Shell Oil Company, 50 West 50th Street, New York 20, New York, or 100 Bush Street, San Francisco 6, California. In Canada: Shell Oil Company of Canada, Limited, 505 University Avenue, Toronto 2, Ontario.

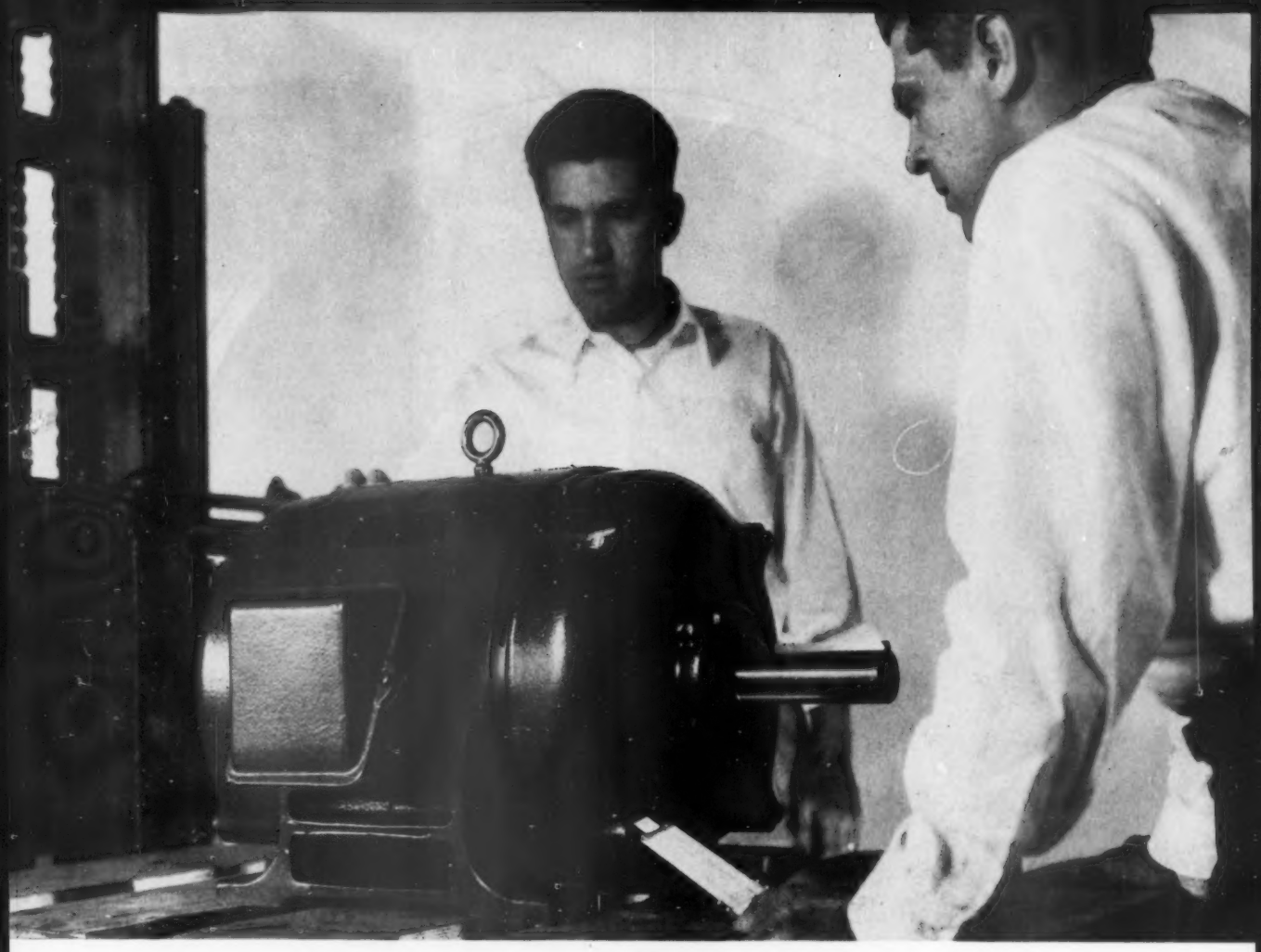
SHELL MACOMA OIL

the extreme pressure industrial gear lubricant

SHELL

For More Information Write No. 151 on Inquiry Card—Page 32

For More Information Write No. 154 on Inquiry Card—Page 32→



New Century Electric motor starts on 50% less current

Here is the answer to power company limits on starting current for *single phase* motors . . . a new Century Electric capacitor-start motor with a really low starting current. In the 20 hp size the *starting* current is 220 amps . . . as low as that for a normal 10 hp motor.

Solve many problems—Because of the high cost of running three phase power to many areas, most utilities prefer to supply single phase power. Now heavier equipment can be started on single phase power. This new motor provides enough horsepower to start and operate equipment like . . . large irrigation pumps, crop and hay dryers and hammermills on an open clutch.

Reliable operation—Insulation is bonded "Mylar" and varnish . . . gives tough mechanical protection, high dielectric strength and resistance to moisture. Motor is smooth and quiet running because of carefully balanced rotor. Rotor laminations are skewed for quiet operation. High pressure aluminum casting gives rotor winding bars high density.

Capacitor box comes in separate weather-protected enclosure . . . means it can be mounted conveniently next to control device or wherever space can be best utilized.

Variety of enclosures—The new Century Electric CPF motor is available in totally-enclosed and dripproof enclosures. Sizes range from 7½ to 20 hp . . . speeds 1200 and 1800 rpm.

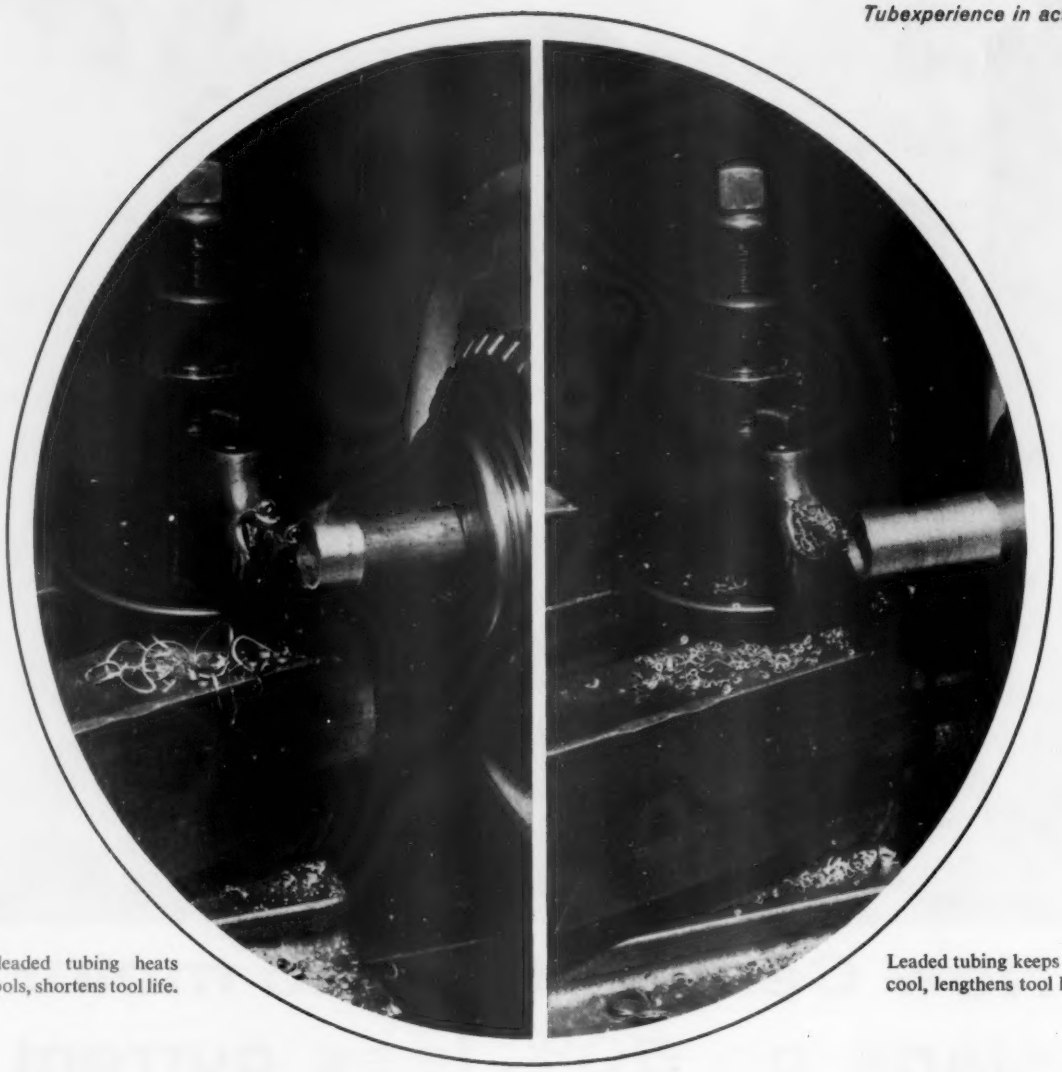
For more information contact your nearest Century Electric Sales Office or Authorized Distributor. For detailed information on motor applications write for the new Century Electric Motor Application Guide . . . bulletin 270A. For *more* than a motor . . .

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century

59-16



Nonleaded tubing heats up tools, shortens tool life.

Leaded tubing keeps tools cool, lengthens tool life.

Now Superior Carbon Steel Tubing with Built-in Lubrication

New leaded 1020 tubing permits faster speeds and heavier feeds, often reduces the number of finishing operations

Where machinability is of major importance, specify Superior Seamless Leaded 1020 Tubing. Its built-in lubrication permits faster speeds in turning, drilling, tapping, milling, grinding and other machining operations, provides an 18% increase in feeds, and often reduces the number of finishing operations required to produce a smooth, lustrous surface. Build-up of metal at the cutting edge of the tool is minimized. Chip formation is improved. Tools operate at lower temperatures, last longer, and require fewer dressings. Lower tool cost is an accompanying benefit. Another is reduced downtime for replacement of dull and wornout tools. There is virtually no difference in physical and mechanical properties between leaded and nonleaded carbon steel tubing. So the grades are interchangeable.

Superior Seamless Leaded 1020 Tubing is available in a range of ODs from .012 through 1⅛ in. For particulars, send for Data Memorandum No. 24. And remember that other small-diameter tubing is available in more than 120 analyses, meeting a very broad range of applications. Superior Tube Company, 2034 Germantown Ave., Norristown, Pa.

Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010 in. to ⅜ in. OD—certain analyses in light walls up to 2½ in. OD

West Coast: Pacific Tube Company, Los Angeles, California • FIRST STEEL TUBE MILL IN THE WEST

For More Information Write No. 155 on Inquiry Card—Page 32



Thousands of sizes . . . available for prompt delivery

Whenever you face the problem of finding the right oil seal quickly . . . in extensive or limited quantity . . . check C/R.

More than 20 types, forming over 7,500 size combinations for shafts from ¼″ to 50″ O.D. are available—the majority from stock! C/R shaft type oil seals fit most seal applications . . from simple dust exclusion to high-speed, high temperature fluid retention under extremely rugged operating conditions where high sealing efficiency must be maintained over long service life.

Check C/R . . . you'll find the seal to solve your problem available from stock in most cases. Or C/R engineers will gladly offer their unrivaled experience and facilities to create and produce special designs.

More automobile, farm and industrial machines rely on C/R Oil Seals than any other similar sealing device.



This new, comprehensive catalog of stock C/R seals is now ready. Write for your free copy.

CHICAGO RAWHIDE MANUFACTURING COMPANY
1239 Elston Avenue • Chicago 22, Illinois

Offices in 55 principal cities. See your telephone book.

In Canada: Manufactured and Distributed by Chicago Rawhide Mfg. Co. of Canada, Ltd., Brantford, Ontario

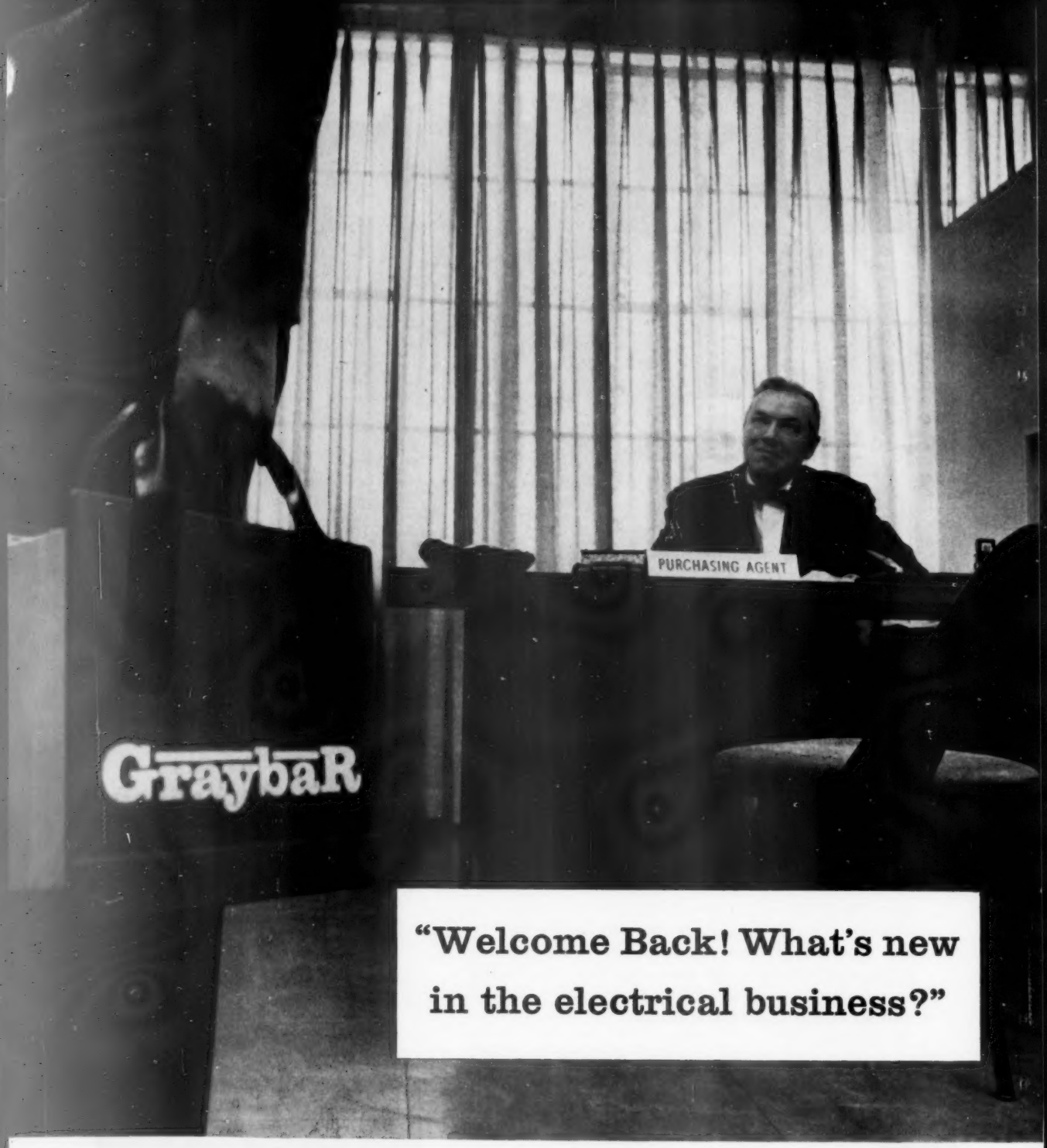
Export Sales: Geon International Corp., Great Neck, New York

OIL SEAL C/R DIVISION
CHICAGO RAWHIDE

Other C/R Products

Sirvene (synthetic rubber) molded pliable parts • Sirvis-Conpor mechanical leather cups, packings, boots • C/R Non-metallic Gears

For More Information Write No. 156 on Inquiry Card—Page 32



"Welcome Back! What's new in the electrical business?"

Whatever is new, if it is right for your plant, your Graybar man recommends it . . . and knows how to put it to work . . . motors, controls, power distribution equipment, wiring or lighting supplies.

Objective *recommendations* and able, point-of-use *help* on anything electrical are available to you*. For both, call Graybar today! 93

*or your electrical contractor.

GraybaR

ELECTRIC COMPANY, INC.

Everything Electrical GraybaR ELECTRIC COMPANY

420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • OFFICES IN OVER 130 PRINCIPAL CITIES

PURCHASING

The Methods and News Magazine For Industrial Buyers

DECEMBER 7, 1959
VOLUME 47, No. 12

B. P. MAST, *Chairman of the Board*
B. P. MAST, JR., *President*
RAY RICHARDS, *Publisher*

Pulse of Business 7
The P.A.'s Outlook 13
Price Trends 15
Sales Inventories, New Orders 19
Washington Report 21
Editorial: How Deep Is Your Bench? 67
Make or Buy—Solve It the Linear Programming Way ..... S. B. Smith 69
You're Never Too Small to Save 73
Push-Button Purchase Orders ..... Joseph Ehrstein 75
Seminars Help Sharpen Materials Management Skills 78
Purchasing's Part in R&D Breakthroughs ..... Alan J. Frankel 80
Cutting Paperwork in a One-Man Department ..... John Van de Water 82
A New Look at Quality, Service and Price ..... Eugene S. Page 84
Forms Forum 87
Price Variance Reports Keep Purchasing Cost Conscious 88
The P.A.'s Legal Responsibility to His Employer ..... A. W. Gray 90
New Synthetic Does Job No Other Rubber Material Will Do 94
Sound Energy Checks Steel Quality at Production Line Speed 98

REGULAR FEATURES

Highlights of This Issue 65

Purchasing Follow-up 27
Information for Your Catalog Files .. 44
Letters to the Editor 50
Purchasing People 57
F.O.B. 60
Products and Ideas 94
Office Equipment and Supplies 160
Association News 172
Industry 184
Employment Service 198
Index to Advertisers 200

EDITORIAL STAFF

Stuart F. Heinritz, Senior Editor
Paul V. Farrell, Editor
Dean S. Ammer, Executive Editor

Ned Kellogg ...Associate Managing Editor
Leonard Sloane .....Associate Editor
John F. Sincere .....Midwestern Editor
John Van de Water .....Technical Editor
Walter E. Willets .....Consulting Editor
L. J. De Rose Editorial Marketing Consultant
Harold C. Barnett ..Assoc. Managing Editor
Mary T. Regan .....Editorial Assistant
A. N. Wecksler .....Washington Editor
A. W. Gray .....Legal Editor
T. C. DuMond .....Contributing Editor
Robert Gunning ...Readability Consultant

ART STAFF

E. Carlton Arink .....Art Director
John Drain .....Associate Art Director

PRODUCTION STAFF

L. E. McMahon .....Production Manager
Barbara Grant .....Production Supervisor

For More Information about ad on facing ←page Write No. 157 on Inquiry Card-pg. 32

CONOVER-MAST PUBLICATIONS, INC.
EDITORIAL AND EXECUTIVE OFFICES
205 East 42nd Street, New York 17, New York

© 1959 by C-M Business Publications, Inc.

PURCHASING is an independent journal, not the official organ of any association. Established 1915 as "The Purchasing Agent." Consolidated with "The Executive Purchaser." Contents are indexed monthly and annually by the Engineering Index Service and Business Periodicals Index.
PURCHASING is published every-other-Monday by C-M Business Publications, Inc., subsidiary of Conover-Mast Publications, Inc., at 440 Post Road, Orange, Conn. Editorial and executive offices, 205 East 42nd Street, New York 17, New York. Volume 47, No. 12. Subscription rates: United States, U. S. Possessions and Canada: $4.00 per year; single copies 75 cents: elsewhere, $20.00 per year; single copies, $1.00. Second-class postage paid at Orange, Conn. and at additional mailing offices.

SUBSCRIPTION CORRESPONDENCE AND CHANGE OF ADDRESS: Write to Circulation Department, PURCHASING Magazine, 205 East 42nd Street, New York 17, N. Y. Please give title and company affiliation in all correspondence. Notify us promptly of any change of address. Be sure to give old as well as new address; include postal zone number, and new company name and title. Enclose address label from a recent issue, if possible. Since mailing labels are addressed in advance, please allow 5 weeks for change to become effective.



Change hats
with your maintenance man . . .



You'll find out . . .

Vertical Lift Magne-blast Breakers have low center of gravity, won't tip over

Find a moment soon to ask the man who maintains your metal-clad switchgear which power circuit breakers are easiest to handle.

He'll tell you he prefers General Electric Vertical Lift Magne-blast Breakers because they have a low center of gravity, aren't awkward and difficult to draw out. Vertical lift Breakers are nearly impossible to tip over, reducing the possibility of breaker damage, injury to personnel and disruption of production. General Electric Company, Schenectady 5, New York. 511-33

Progress Is Our Most Important Product

GENERAL ELECTRIC

For More Information Write No. 158 on Inquiry Card—Page 32

Pulse of Business

Steel's Part In the GNP

THE SERIOUS economic impact of the steel strike shows up all too clearly in the latest Gross National Product figures. Preliminary estimates put third quarter GNP at a $478.6 billion-per-year-rate—off $5.9 billion from the previous quarter.

Steel, of course, was the major cause of the dropoff. Second quarter GNP was inflated by the sharp buildup in steel inventories. And the third quarter figure was sharply reduced by the high rate at which inventories were devoured—while new output was curtailed by the 116-day walkout.

Inventories were not the only area of GNP that declined from the April-June quarter. Consumer spending for durable goods fell to $43.6 billion from $44.1 billion (seasonally adjusted annual rate). And outlays for new construction dropped at an annual rate of $500 million to $22.6 billion.

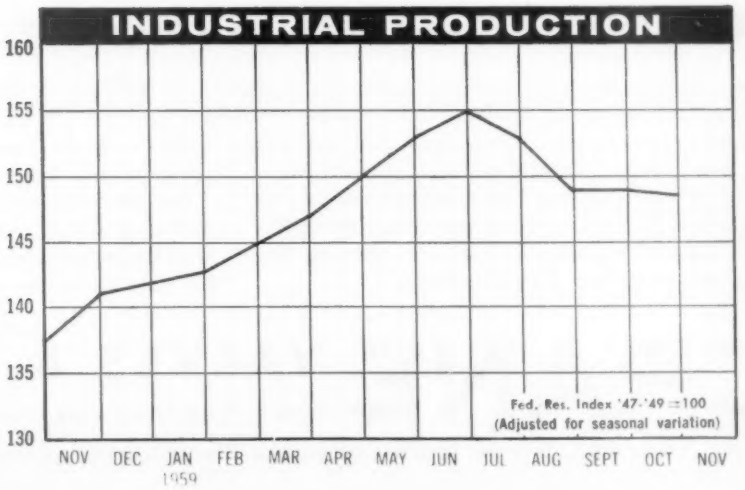
Some Sectors Maintained Strength

However, certain key sectors of the GNP maintained and even increased their strength in the face of the long strike. Exports were up and there was a slight increase in consumer spending for nondurables. Plant and equipment expenditures rose and state and local government outlays increased.

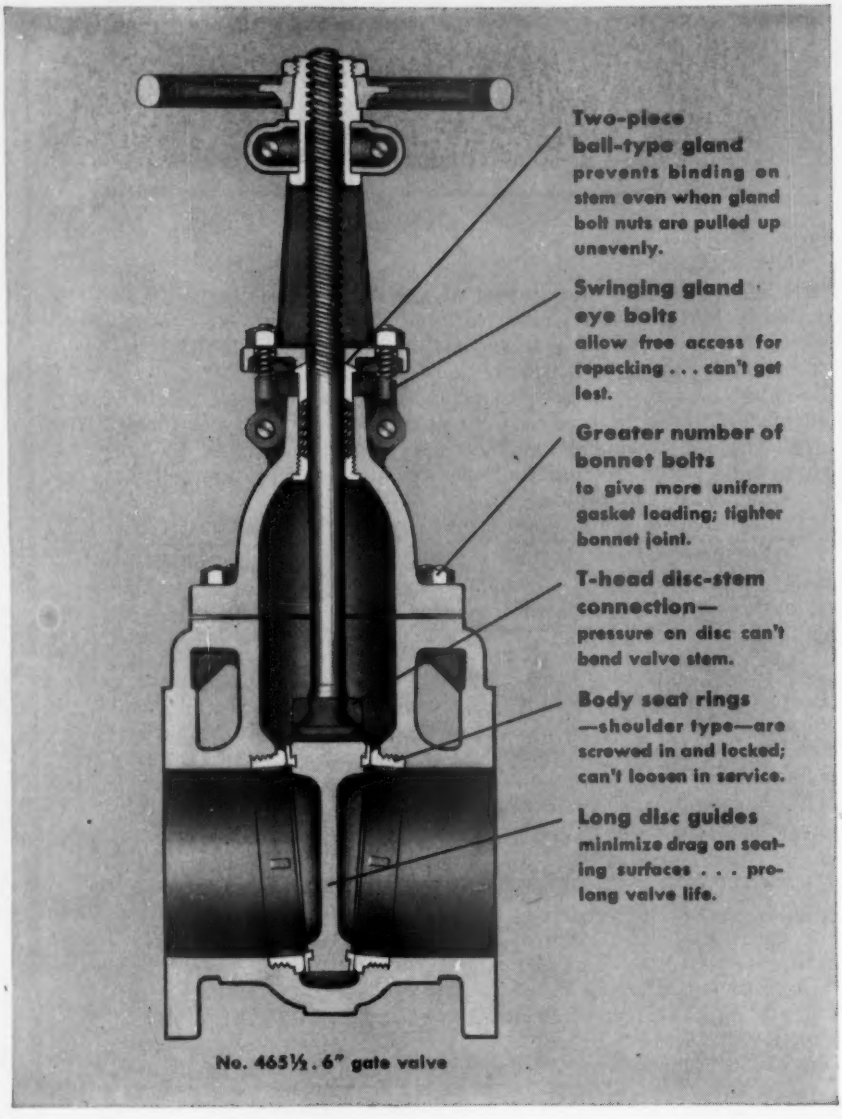
So despite the decline in the third quarter, the GNP was still about 8% greater than the similar period of 1958 and—says the Department of Commerce—"considerably higher" than the pre-recession peak.

Where do we go from here? Government economists are brimming with optimism—at least until the January 26th Taft-Hartley injunction deadline.

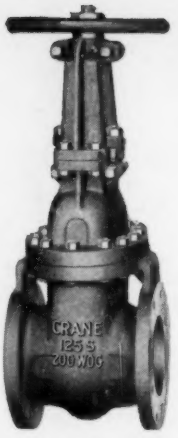
They're convinced that the fourth quarter GNP will be higher than the third. Tentatively, Federal analysts estimate the last quarter figure to be $486 billion. This would mean a 1959 output of $480 billion, a record high. It would also mean an 8% improve-



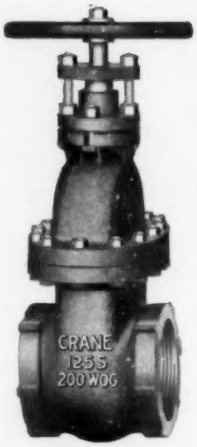
The FRB's Industrial Production Index fell a point in October to 148 (1947-49 = 100). The index for the two previous months was 149—while the pre-steel strike figure was 155.



No. 465½. 6" gate valve



No. 465½. 125-Pound, OS&Y, bronze trimmed. Flanged ends. 2" to 48". Also in all-iron.



No. 460. 125-Pound, non-rising stem. Bronze trimmed; screwed ends. 2" to 8". Also in all-iron (to 4" only).

The valves most plants rely on—
CRANE 125-POUND IRON BODY GATES

On general utility services . . . water mains and distribution lines . . . low-pressure steam and hot water . . . air and gas . . . more plants rely on Crane No. 465½ iron body bronze trimmed gates than on any other valve in this class. The cross section above reveals some of the advantages of Crane improved iron valve design . . . how they assure dependable operation through long life and provide for convenient servicing.

To enable you to standardize on these economical, efficient valves, Crane builds No. 465½ gates in sizes from 2 to 48 in. Popular sizes are available from local stocks of your Crane branch or Crane wholesaler.

See your Crane catalog for the widest selection of iron body valves: gates, globes, angles and checks. Your local Crane Representative will be glad to help choose the right valves for your service.

CRANE® VALVES & FITTINGS

PIPE • PLUMBING • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Illinois—Branches and Wholesalers Serving All Areas

For More Information Write No. 159 on Inquiry Card—Page 32

ment over last year when the GNP totaled $441.7 billion.

The previous record for Gross National Product was $442.5 billion in 1957. The year before GNP totaled $419.2 billion. Thus, even allowing for price inflation, the 1959 GNP should be far higher than ever before.

Estimates for the 1960 Gross National Product are for still greater production by American industry. The United States Chamber of Commerce predicts that next year's output will range somewhere between $505 and $510 billion.

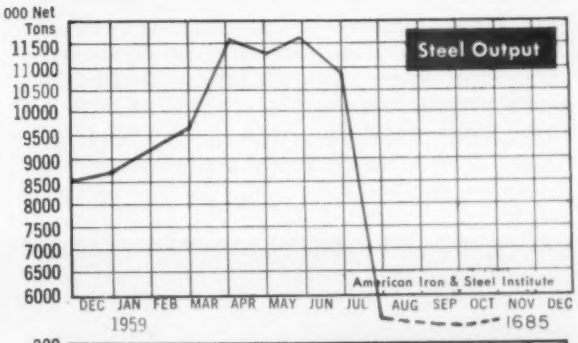
In fact, the Chamber of Commerce anticipates an even higher GNP for the fourth quarter of 1960. Its prediction: $520 to $525 billion.

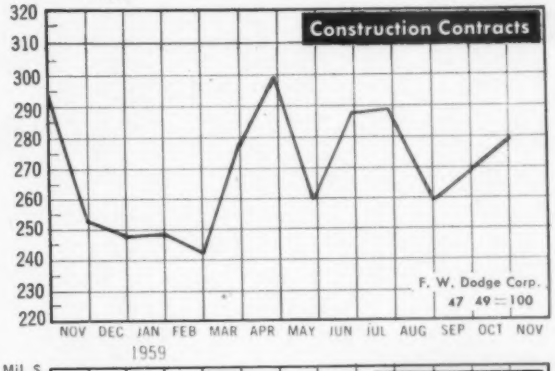
With P.A.'s currently placing orders for steel —along with other materials and components —at a rapid pace, the government forecast seems to be well on the safe side. How much higher GNP might have been if there had been no strike is something best left to the Hot Stove League.

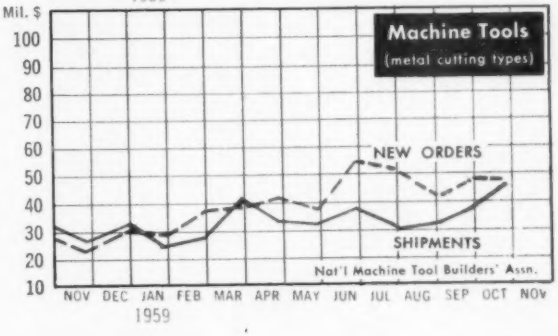
THE THEORY of an arbitrary level of national economic growth has been attacked—and attacked strongly—by a leading economist.

The economist is W. Allen Wallis, dean of the Graduate School of Business at the University of Chicago. The importance of his statements on our growth rate is strengthened by the fact that he is now on leave from his post and is serving as executive director of Presi-

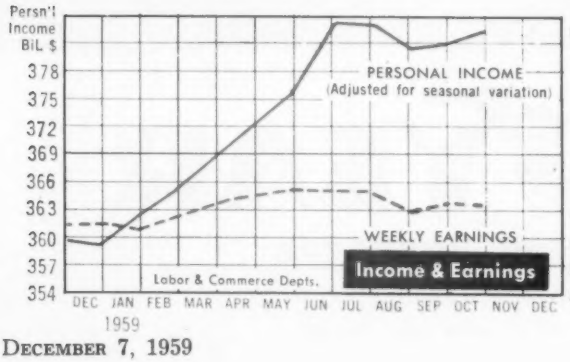
PRODUCTION

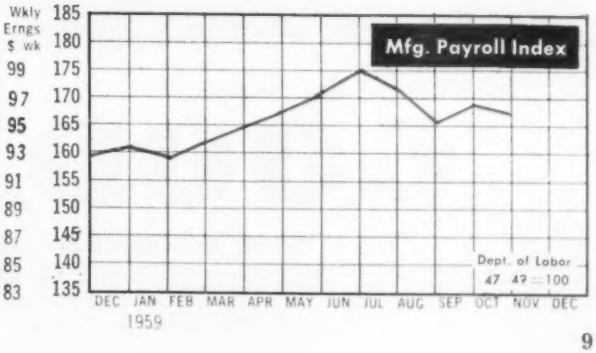






LABOR





Handling a hot job at a cool $1400-a-year saving

They don't spare the belts around busy foundries like this one in the Midwest. And their shakeout conveyor was in a specially hot spot—handling smoking sand at temperatures well over 250°F, occasionally reaching a near-incandescent 450°F. Little wonder belt life averaged only 43 days.

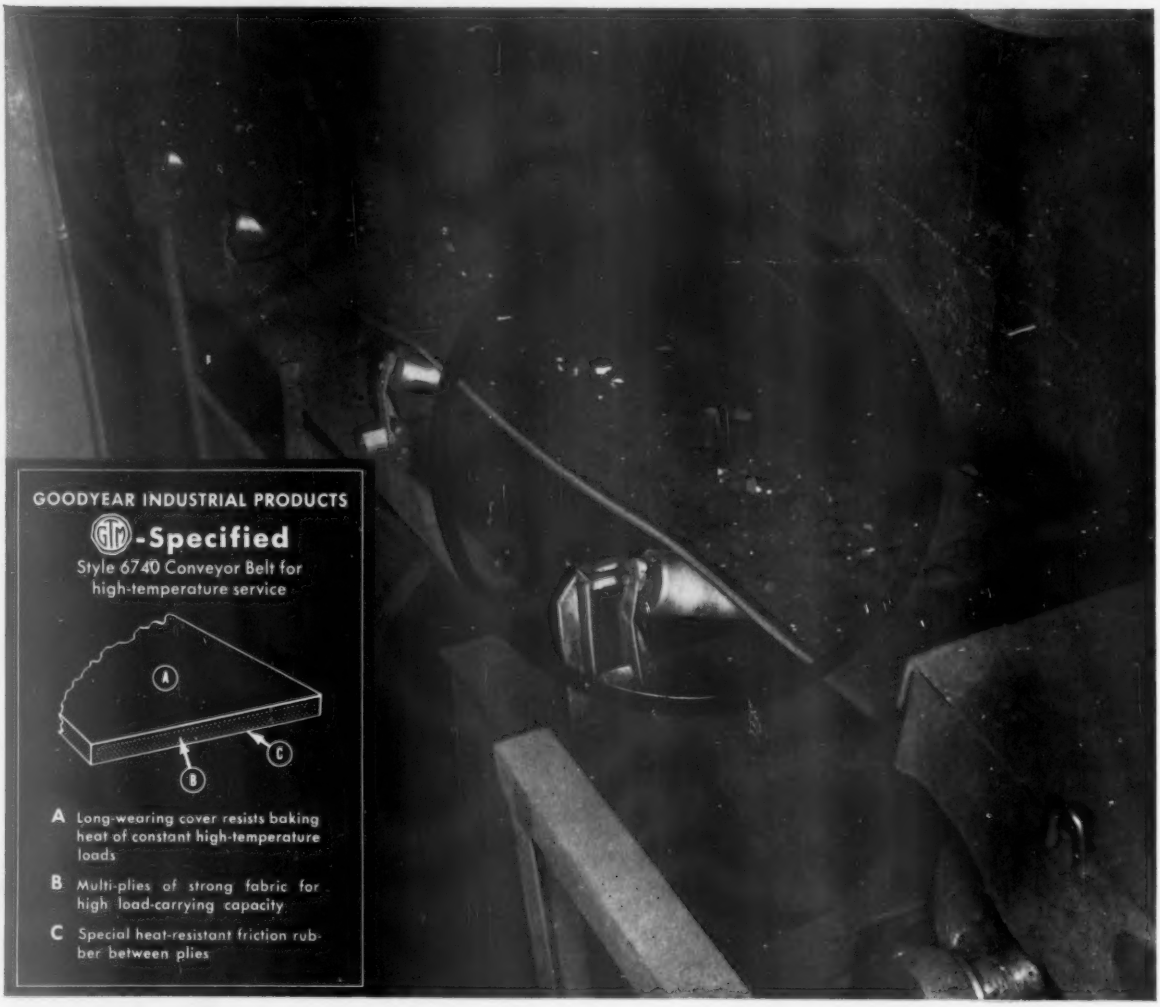
But that was before the G.T.M.—Goodyear Technical Man—appeared on the scene. His recommendation: Style 6740 conveyors especially designed to resist the usual cracking, charring effects of "cooking" heat.

The results: carefully kept records showed a succession of 5 of the G.T.M.'s belts averaging 154 days apiece—*more than 3½ times previous service.* And that meant a yearly saving of exactly $1,435.40.

Isn't this the kind of dollars-and-cents improvement you'd like to make in your shop? If it takes industrial rubber, the G.T.M.'s your man. Contact him through your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

• • •

IT'S SMART TO DO BUSINESS *with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and non-rubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."*



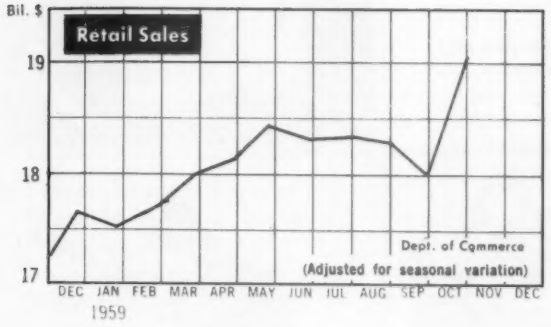
CONVEYOR BELTS BY

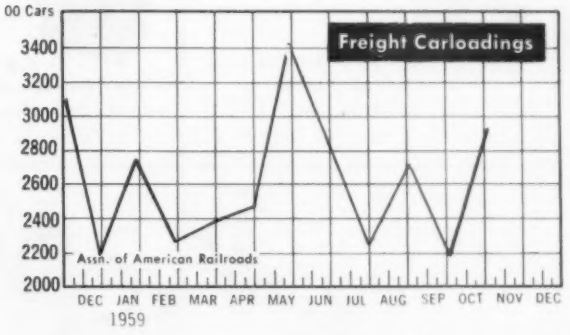
GOODYEAR

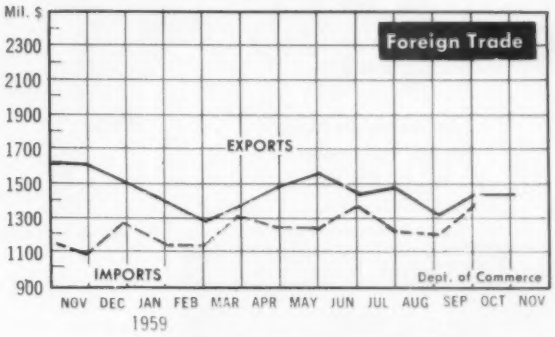
THE GREATEST NAME IN RUBBER

For More Information Write No. 160 on Inquiry Card—Page 32

TRADE







dent Eisenhower's Cabinet Committee on Price Stability. As such, he is the chief economic adviser to Vice President Nixon, head of the committee.

Wallis is opposed to the government getting "caught in a futile numbers game." And he's against comparing growth rates with other countries and other times.

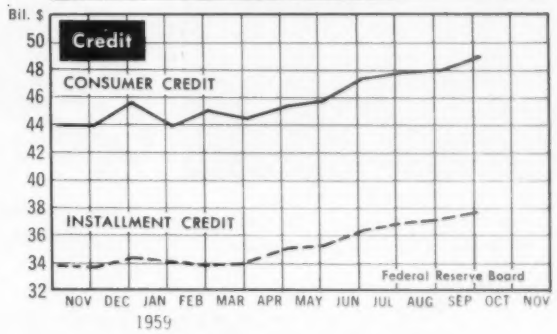
His remarks are apparently designed to rebuff recent statements by Democrats who have urged a higher growth rate. Many Democrats believe the present average annual growth rate of 3% should be boosted to 4% or 5% with the help of Federal spending. Some Democrats charge that the Soviet Union is outstripping us with its annual growth rate of 7% or more.

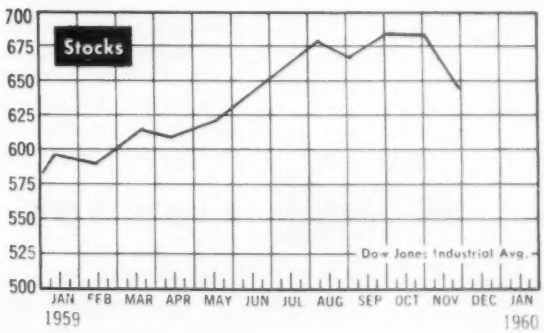
But Wallis feels that the setting up of arbitrary percentages for economic growth would not be good policy. He fears there would be too much concern about numbers and not enough concern about the essentials that comprise our economy.

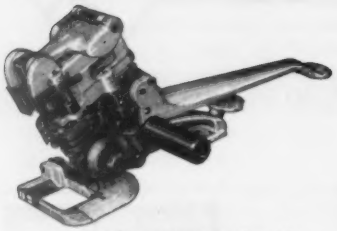
"It would be unwise to attach great importance to attaining any particular figure for the rate of growth," he says. "Not only because the figures are too inexact, but also because growth is too complex and too poorly understood a process for precise planning projection."

It appears certain that the political squabble over economic growth will continue during the session of Congress that begins next month. Both sides of the aisle want greater growth —but the halls of Congress will soon be ringing with arguments on how to best encourage it.

FINANCE







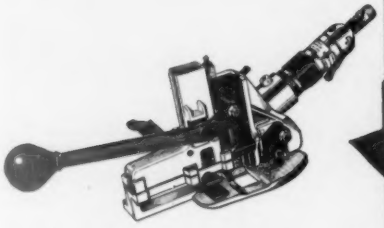
The only one-hand strapping tools SFC Series

Power strap feeders Model PSF

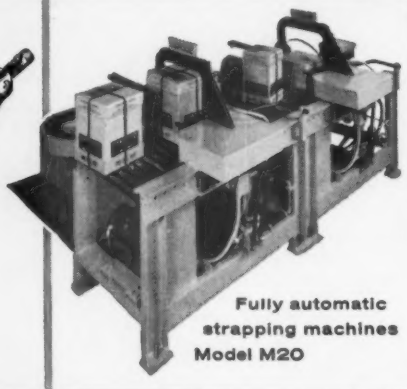


Complete line of air power tensioners PN Series

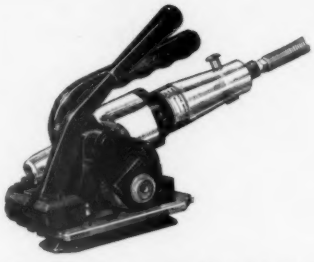




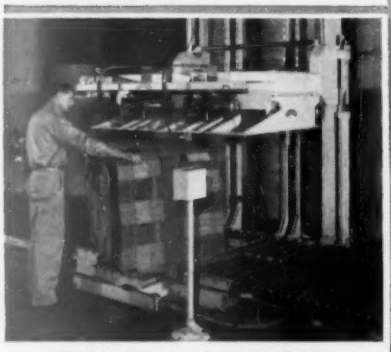
Air power portable strapping machines AP Series



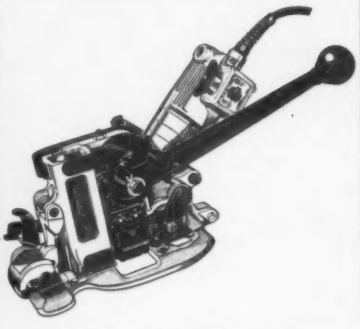
Fully automatic strapping machines Model M20



The first air power feed wheel tensioner for heavy duty strapping FN Series



First compression strapping machines with built-in turntable for 2-way strapping. CSF Series



Electric portable strapping machines. AE Series



N Series

Heavy-duty air power sealers

9 ways to new savings

Binding things together with steel strapping is a low cost way to eliminate individual handlings, save space, and prevent damage. These nine machines—part of the most complete line of equipment in the steel strapping industry—create new ways to save with strapping. Signode will be glad to help you select the right equipment and devise methods to make the most of it. There's a Signode man near you. Call him today, or write:



First in steel strapping

SIGNODE STEEL STRAPPING CO.

2676 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

For More Information Write No. 161 on Inquiry Card—Page 32

The P. A.'s Outlook

- **P.A.'s Fear Another Steel Walkout**
- **Some Buyers Expect Steel Prices to Rise**
- **Associations Report Shrinking Inventories**

THE REPERCUSSIONS of the recent steel strike and the threat of its resumption next month are among the major concerns of P.A.'s today.

In business surveys conducted by PURCHASING Magazine and national and local purchasing agent associations, buyers are voicing their uncertainty about the business future. There are a few who are less optimistic now than they were earlier.

For example, an Alabama purchasing agent says "I expect to have to pay higher prices for steel when the situation is cleared up. But I wish it would finally be settled so that I can make definite plans."

An Arizona director of purchases agrees. "The steel contract, if and when negotiated, might have a tendency to increase costs of basic steel," he says. "But once that's done, we can plan ahead. Now we're stymied."

The National Association of Purchasing Agents reports "we are facing an extended period of readjustment. . . . We have about reached the end of the line in maintaining production by imports, special purchases, swaps, and other ingenious methods of bolstering thinning inventories."

The N.A.P.A. survey says that "a cautious attitude is prevalent in buying policy. Purchasing executives are maintaining a flexible position so that they can rapidly extend or contract commitments as the future business picture becomes more clear."

The Chicago association notes that "inventories continue to shrink. Almost four times as many members report smaller stocks than the percentage noted" four months ago.

Its business survey committee says "the gloomy picture reported last month has not brightened. Curtailed inventory positions and continued rising prices make this a critical period for industry."

Here's what the Cleveland association says: "steel . . . the one word that is the topic of many, many conservations today. Production is down, new orders are off and the resulting unemployment is materializing."

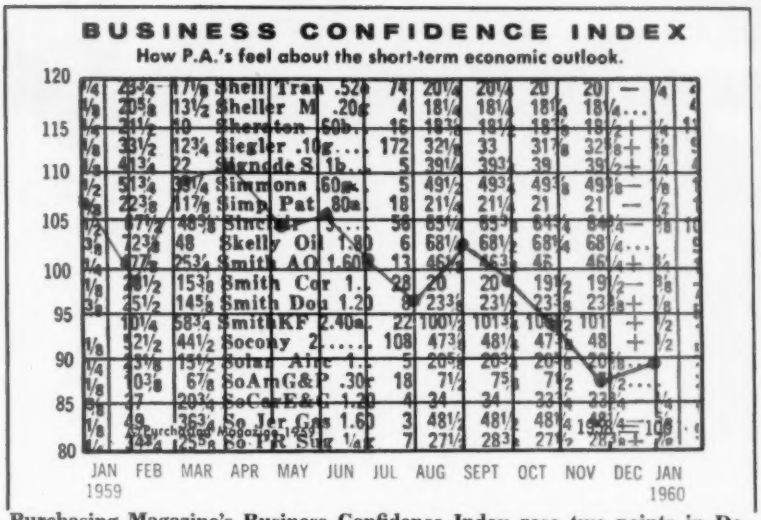
One member of the Cleveland group says "General business will suffer a setback during the first quarter due to expected severe material shortages at that time." Another states, "We look for steel products to be in tight supply for the next nine months, with critical shortages developing in flat rolled products."

The Pittsburgh association reports "most of our members are waiting for the end of the steel strike before making any move toward accumulating stocks."

It adds "overtime has been curtailed and in some instances eliminated completely."

According to the Georgia association, over 50% of its members expressed concern over the steel strike. Some members report production has stopped at their plants.

The Canadian group says the construction and automotive industries are the hardest hit by the steel shortages.



Purchasing Magazine's Business Confidence Index rose two points in December to 90 (1958=100). The increase in this sensitive indicator of nationwide purchasing agent opinion shows that P.A.'s are becoming more confident that business conditions in the early part of 1960 will show an improvement over recent months.

Building Today, with an Eye to Tomorrow



MEETING *of* MINDS!

Each of these men has an expert mind in his field—administrative, sales, finance, raw materials, production. Each contributes years of practical experience, rigorous theoretical knowledge and proven executive ability. Together they constitute Inland Steel Company's Products and Facilities Planning Committee—keeping a watchful eye on consumer and industrial trends and requirements, guiding the company's development and expansion.

To their attention are brought market studies, design forecasts, new product possibilities, material resource potentials, new production methods, future equipment needs. They are excellent listeners, they travel often to see for themselves, and they are doers—initiating programs which have upped Inland's steelmaking capacity 15% to 6,500,000 ingot tons in just three short years.

The work of this committee, like the future of America's expanding economy, is never ending. Keeping pace with midwest industrial growth, Inland completes each stage in its expansion plan and looks ahead . . . for the next job.

INLAND

INLAND STEEL COMPANY
30 West Monroe Street • Chicago 3, Illinois
Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis
Kansas City • Milwaukee • New York • St. Louis • St. Paul

Other Members of the Inland Family
JOSEPH T. RYERSON & SON, INC.
INLAND STEEL PRODUCTS COMPANY
INLAND STEEL CONTAINER COMPANY*
INLAND LIME & STONE COMPANY* *Division

For More Information Write No. 162 on Inquiry Card—Page 32

Price Trends

- **U.S. Copper Production Is Sharply Reduced**
- **Slight Demand Noted For Lead, Zinc & Tin**

UNCERTAINTIES over labor negotiations in basic industries have had a dampening effect on the nonferrous metal markets in recent weeks. But purchasing agents are now stepping up their buying for 1960 requirements.

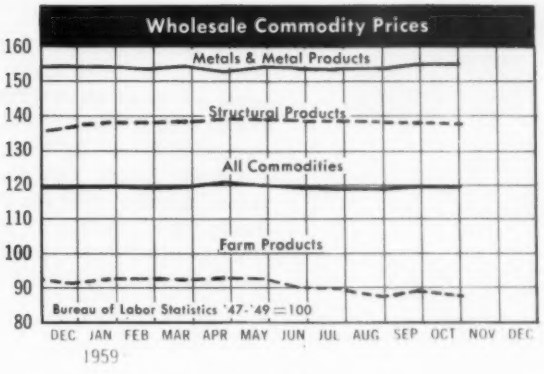
Here's how the situation shapes up in some of the major commodities:

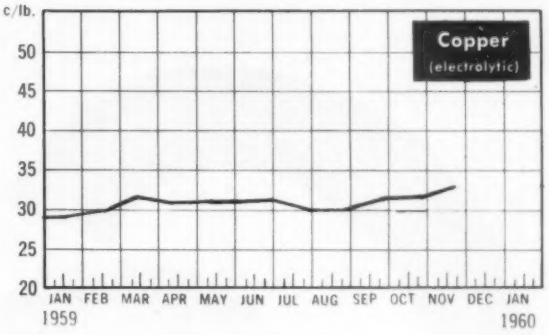
Copper: With a large amount of copper production halted due to strikes that began in August, imports have been somewhat larger recently. Some buyers for large copper consumers —especially wire mills—have been urging the government to dispose of part of the 135,000 tons of surplus copper from its stockpile. However, Federal policy in situations like this has generally been not to dispose of stockpiled materials during strikes.

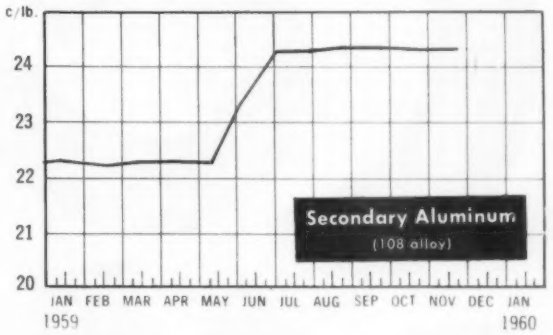
The effects of the walkouts are highlighted in the latest monthly report of the Copper Institute. Although worldwide deliveries to copper fabricators fell 21,337 tons to 210,945 tons, shipments outside the U.S. rose 2516 tons. In the same period, domestic deliveries fell 23,853 tons.

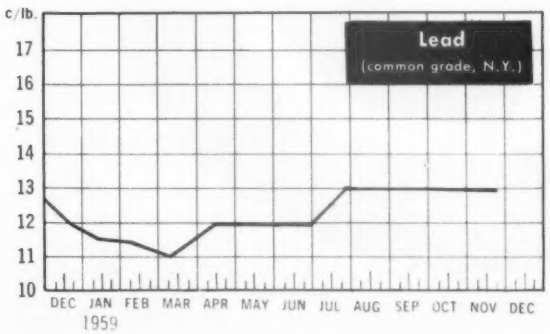
Lead: In the last three months, purchasing agents have not been in the market for large tonnages of lead. More activity is expected this month as inventories are whittled down.

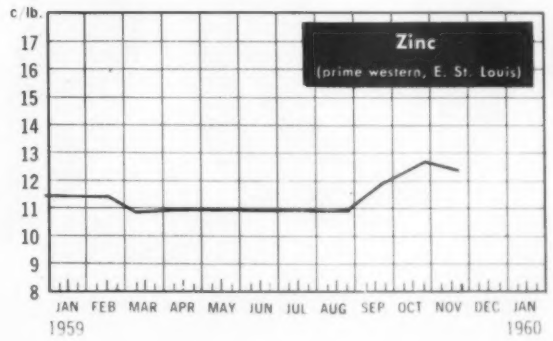
The latest monthly report of the Bureau of Mines shows that lead mine output declined slightly to 20,348 tons. For the first three quarters









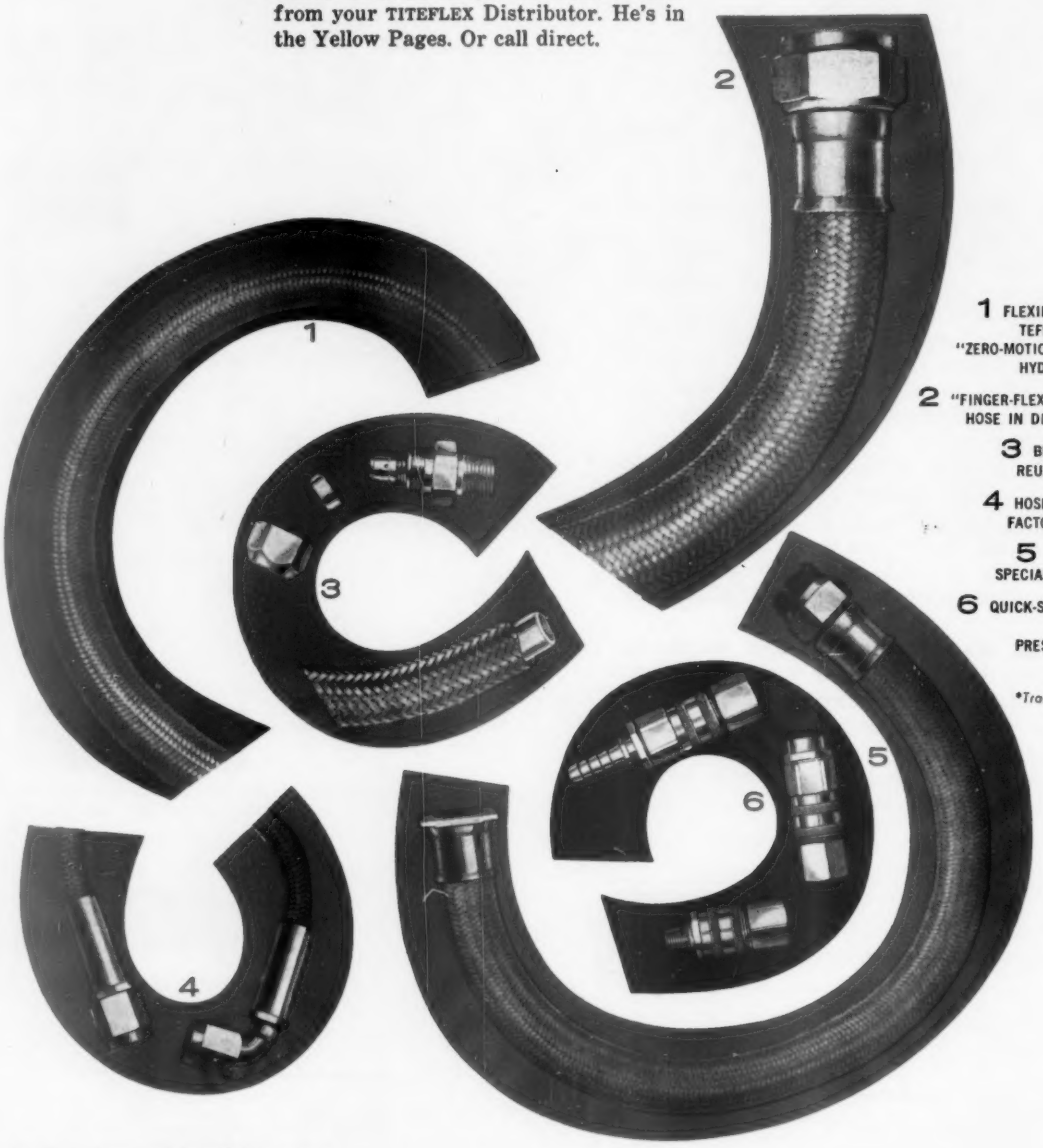


titeflex...flexible hose for industry's toughest jobs

One flexible hose source:
any type or size for the application you specify.

Every inch of TITEFLEX flexible hose is as perfect as it can be made. We know, because we make all TITEFLEX hose, from end to end, inside and out, right in our own plant. Where fluid transfer problems are really rough, requiring special features, industry calls for TITEFLEX. Why waste time, you'll get the answer fast from your TITEFLEX Distributor. He's in the Yellow Pages. Or call direct.

titeflex



1 FLEXIBLE METAL AND TEFLON HOSE WITH "ZERO-MOTION" BRAID—AIR, HYDRAULIC, LIQUID

2 "FINGER-FLEXIBLE" TEFLON* HOSE IN DIAMETERS TO 2"

3 BULK HOSE WITH REUSABLE FITTINGS

4 HOSE ASSEMBLIES—FACTORY ASSEMBLED

5 STANDARD AND SPECIAL CONNECTIONS

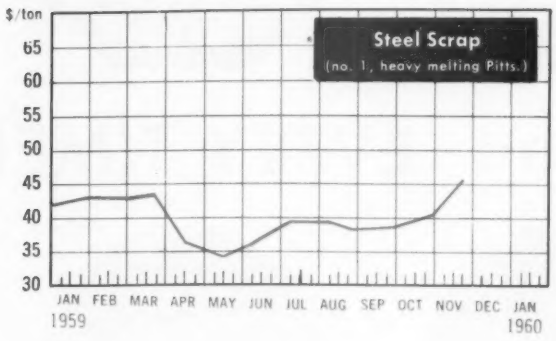
6 QUICK-SEAL COUPLINGS —HIGHER THE PRESSURE, TIGHTER THE SEAL

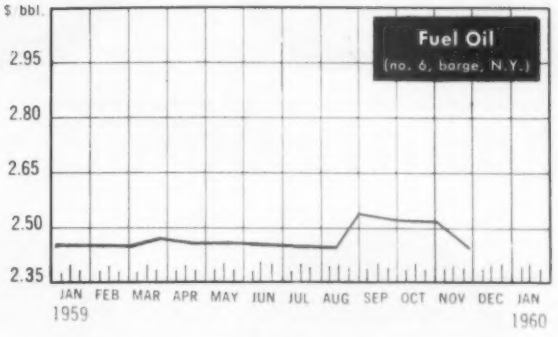
*Trademark of duPont

titeflex inc. springfield mass. PACIFIC DIVISION · SANTA MONICA · CALIFORNIA

For More Information Write No. 163 on Inquiry Card—Page 32

Price Trends





of 1959, production of recoverable lead amounted to 189,952 tons—off about 10,000 tons from the corresponding period last year.

Zinc: P.A.'s for galvanizing mills have been doing most of the zinc buying in recent weeks. On the whole, few orders are being reported by suppliers.

Observers feel that a real pickup in buying won't begin until the turn of the year.

Tin: Despite the reopening of the steel mills followng the Taft-Hartley injunction, tin buying has not increased markedly. Prices have been generally irregular.

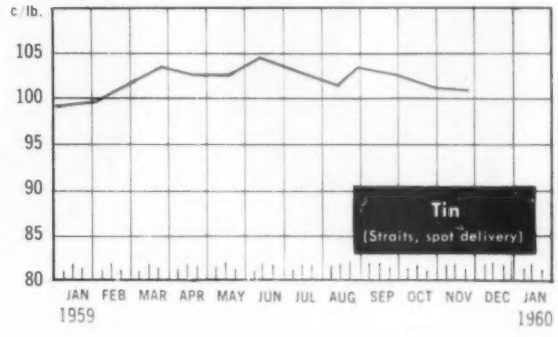
According to the latest monthly report of the Bureau of Mines, consumption of primary tin in this country dropped to 2185 tons. This is a 1025 ton decline from the previous month.

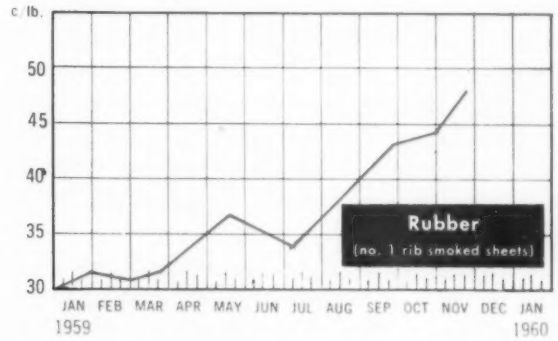
Aluminum: The monthly report of the Aluminum Association shows a 5557 ton aluminum production increase over the previous month. The new figure is 173,762 tons—the second highest monthly output in history.

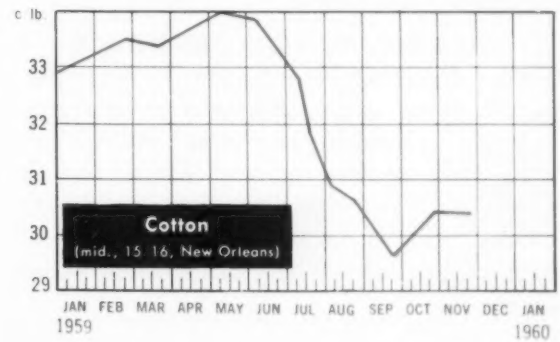
The industry is currently operating at about 87% of capacity. This is somewhat lower than the early part of the year, when the operating rate was 91%.

Wholesale Prices: The Wholesale Price Index fell 0.4% to 119.2 in October (1947-49=100). Nevertheless, commodities other than farm products and foods rose 0.1% to a new high of 128.5.

Machinery and motive products fell 0.2%, while fuel, power, and lighting materials dropped 0.4%. However, the index for metals and metal products rose 0.5% to a new high of 154.5.









POSITIVE DUPLICATION – EVERY TIME!



From a given point, the needles of these compasses always point to the earth's magnetic poles . . . an important aid to exploration and navigation.

The (PD)° marking on these CINCINNATI Surface Grinding Wheels (and *all* CINCINNATI WHEELS) points to an important and remarkable quality . . . Positive Duplication, time after time after time.

CINCINNATI (PD) WHEELS do a better job for you, because 36 separate quality control steps in the unique (PD) process result in wheels of unsurpassed uniformity.

UNIFORMITY TO YOUR ADVANTAGE

Perhaps every wheel manufacturer has complained about the weather and its changing effects on the product. But Cincinnati has followed Mark Twain's advice and has done something about the weather.



Temperature and humidity of the Mold Room are controlled at exact, unchanging levels—every hour of every day *throughout the year!* In addition, (PD) vitrified wheels are fired in a tunnel in unvarying conditions of atmospheric control at critical sections within the kiln.

Result: Each of your re-order (PD) wheels will act and grind exactly like the original wheel.

CALL CINCINNATI

For experienced help in cutting costs, in grinding machine setups and operations, there are Cincinnati grinding specialists available to you. Call your CINCINNATI (PD) GRINDING WHEELS distributor, today, or contact Cincinnati Milling Products Division, Cincnnati 9, Ohio.

(PD) POSITIVE DUPLICATION

CINCINNATI® GRINDING WHEELS

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

°Trade Mark Reg. U.S. Pat. Off.

For More Information Write No. 164 on Inquiry Card—Page 32

Sales, Inventories, Orders

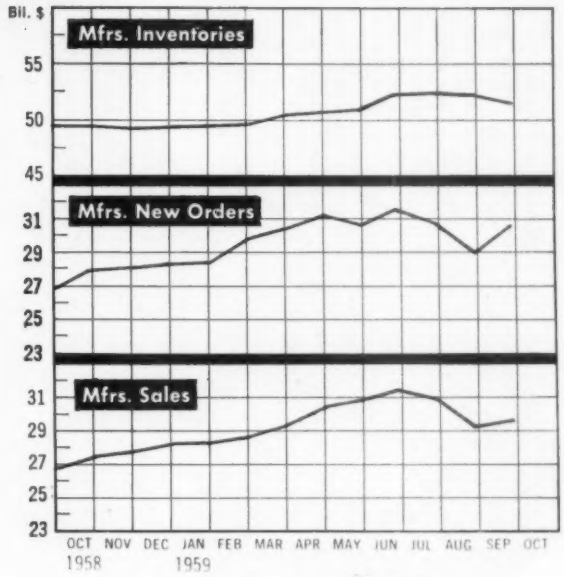
• Inventories Fall, While Sales, New Orders Rise

MANUFACTURERS' inventories fell for the second straight month in September because of the impact of the steel strike. However, sales and new orders advanced.

Inventories were a seasonally-adjusted $51.8 billion—off $300 million from the previous month. Liquidation was heaviest in the fabricated metal, automobile, and other transportation equipment industries.

The sales rise—$400 million to $29.6 billion—was centered in durable goods. In this area, shipments rose $300 million to $15.5 billion.

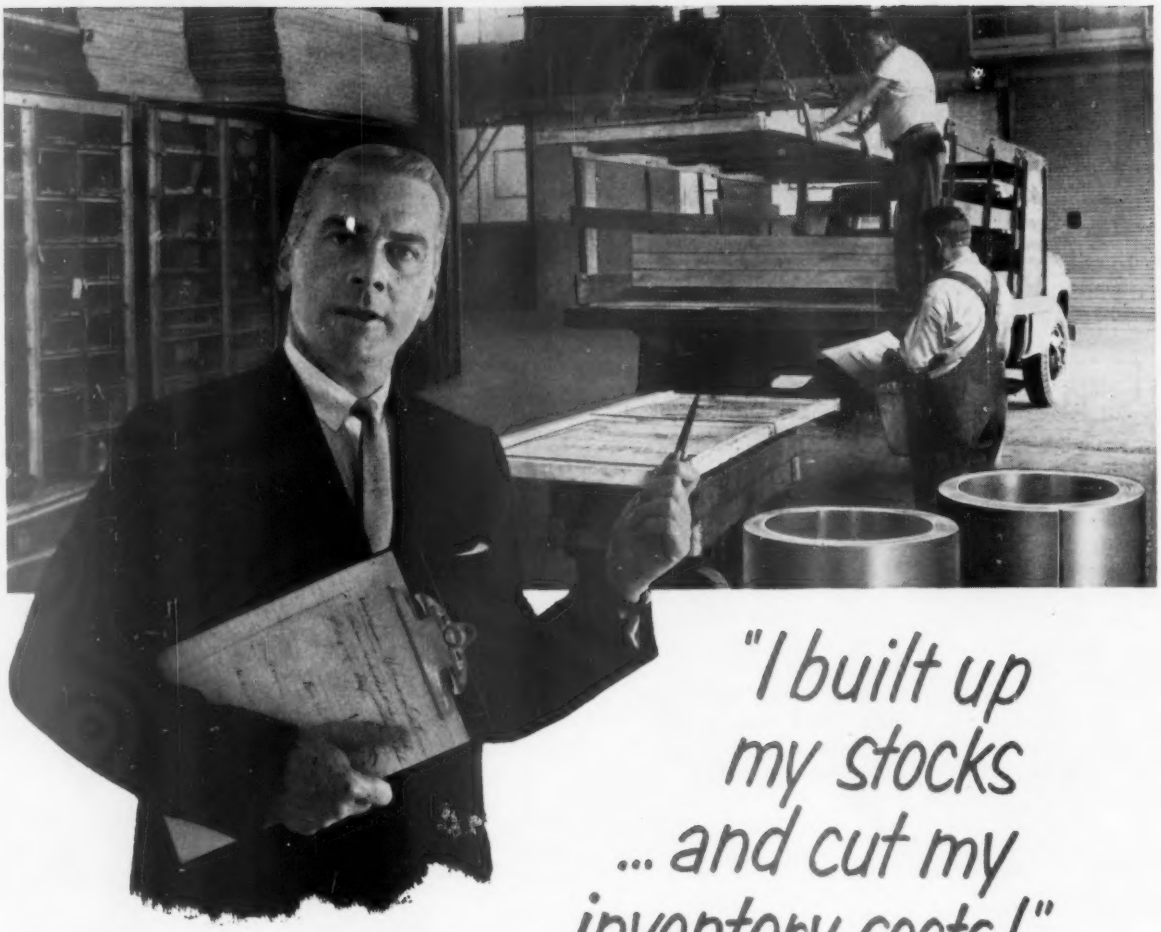
The new order gain to $30.6 billion was also led by durables. All major industries in this group reported an increase in new bookings, with the exception of transportation equipment.



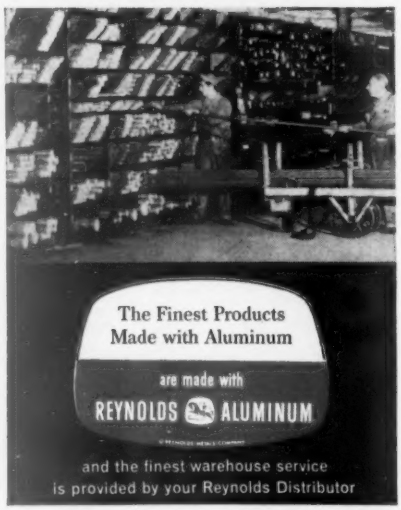
Dept. of Commerce—Seasonally adjusted

	1958	1959				
	Sept.	May	June	July	Aug. (r)	Sept. (p)
Manufacturers' Sales Seasonally Adjusted (Millions of Dollars)						
All Manufacturing Industries	26,804	30,742	31,248	30,858	29,203	29,649
Durable-goods industries	12,723	15,515	15,771	15,384	14,008	14,115
Primary metal	2,065	2,858	2,916	2,104	1,227	1,200
Fabricated metal	1,593	1,711	1,758	1,787	1,703	1,788
Machinery	3,999	4,507	4,565	4,778	4,651	4,698
Transportation equipment	2,438	3,463	3,558	3,667	3,577	3,601
Lumber and furniture	850	1,041	1,035	1,077	991	968
Stone, clay, and glass	701	766	768	805	751	702
Nondurable-goods industries	14,081	15,227	15,477	15,474	15,195	15,534
Food and beverage	4,312	4,617	4,614	4,540	4,511	4,627
Tobacco	386	388	414	382	395	410
Textile	1,027	1,310	1,281	1,256	1,250	1,216
Paper	949	1,026	1,042	1,060	1,011	1,052
Chemical	2,071	2,089	2,125	2,171	2,092	2,139
Petroleum and coal	2,860	2,994	3,095	3,093	3,071	3,245
Rubber	464	524	520	519	492	520
Manufacturers' Inventories Seasonally Adjusted (Millions of Dollars)						
All manufacturing industries	49,296	51,599	52,138	52,241	52,116	51,813
Durable-goods industries	28,048	29,734	30,227	30,349	30,145	29,749
Primary metal	4,043	4,312	4,201	4,108	3,980	3,937
Fabricated metal	2,842	3,278	3,365	3,411	3,328	3,104
Machinery	9,074	9,482	9,725	9,802	9,826	9,745
Transportation equipment	6,751	7,167	7,386	7,397	7,333	7,223
Lumber and furniture	1,732	1,759	1,764	1,823	1,841	1,863
Stone, clay, and glass	1,212	1,254	1,276	1,270	1,261	1,278
Non-durable goods industries	21,248	21,865	21,911	21,892	21,971	22,064
Food and beverage	4,598	4,967	4,928	4,847	4,833	4,852
Tobacco	1,838	1,873	1,819	1,838	1,866	1,945
Textile	2,499	2,487	2,532	2,534	2,495	2,546
Paper	1,405	1,482	1,492	1,457	1,473	1,466
Chemical	3,747	3,730	3,768	3,847	3,907	3,942
Petroleum and coal	3,271	3,380	3,366	3,314	3,332	3,228
Rubber	1,024	995	1,013	1,075	1,113	1,134
Manufacturers' New Orders Seasonally Adjusted (Millions of Dollars)						
All manufacturing industries	27,047	30,541	31,404	30,827	28,951	30,641
Durable-goods industries	12,859	15,241	16,133	15,493	13,974	15,018
Nondurable-goods industries	14,188	15,300	15,271	15,334	14,977	15,623

(r) Revised. (p) Preliminary.



"I built up my stocks ... and cut my inventory costs!"



The cost of keeping a complete inventory of aluminum on hand *can* be cut . . . a lot more than you might think! Your nearby Reynolds Distributor provides a *complete* aluminum service. He can get you the aluminum *you need*, and he can get it to you, *fast!* There's no need to tie capital and working space in inventory when you can rely on the Reynolds Distributor nearest you.

Call on him, too, for technical advice and for the many services he can offer. His staff is aluminum-trained. They'll be happy to serve you. *Reynolds Metals Company, P.O. Box 2346-DK, Richmond 18, Virginia.*

Watch Reynolds TV shows—"ALL STAR GOLF", "BOURBON STREET BEAT" and "ADVENTURES IN PARADISE"—ABC-TV

FOR FAST DELIVERY OF ALUMINUM, CALL THE REYNOLDS DISTRIBUTOR

Check the yellow pages of your telephone directory, under "Aluminum"

For More Information Write No. 165 on Inquiry Card—Page 32

Washington Report

Congress to Tackle Economic Policy Next Month

GOVERNMENT agencies are busily establishing the positions they will present at the next session of Congress.

In some instances, legislation is involved. But in most cases, it is the general policy of the Administration which is being established.

For the purchasing agent, there are three areas of government policy primarily affecting his interest: (1) regulations affecting trade and commerce; (2) policies affecting contracting and price; and (3) money controls affecting interest rates and credit availability.

In general, what is being prepared is a fairly plush government budget. This will contain large sums for the military, for foreign economic aid, and for public works and social programs.

It will be served up, however, as if it were an austere budget that curtails government spending, with many cutbacks in desirable projects. The general strategy is that if government spending can be held down, the tax yield next year will produce a surplus in the Federal budget.

For the first half of 1960, government spending will be more conservative than in the last half. The Administration has lifted its ban on new starts in power and reclamation projects, obviously alert to the presidential and congressional elections next year.

Conservative Money Policies

On general economic policy, the approach of key government agencies concerned with monetary and credit functions will be highly conservative.

The President's Council of Economic Advisors will submit a report on the nation's economic health and outlook toward the end of next month. While the economists will not have been able to fully gauge the impact of the strikes in metals at that time, there is the general assumption that the catch-up period during the first half of the year will guarantee a high level of production. What concerns the Council is how to stretch out the recovery period to prevent a business feast during the first six months and then a reduction in mill operations in the second half.

Coupled with the Council's report will be a report by the President's Cabinet Committee on Price Stability for Economic Growth. Here again the approach will be to stretch out the period of prosperity by pressing for a conservative policy in government spending and for credit control.

Maintaining Interest Rates

In the field of credit and interest rates, the Federal Reserve System view is this: As long as no economic downturn is in sight, interest rates will continue at the current level. If boom levels were to create more demand for loans, some further hikes in money rates could develop.

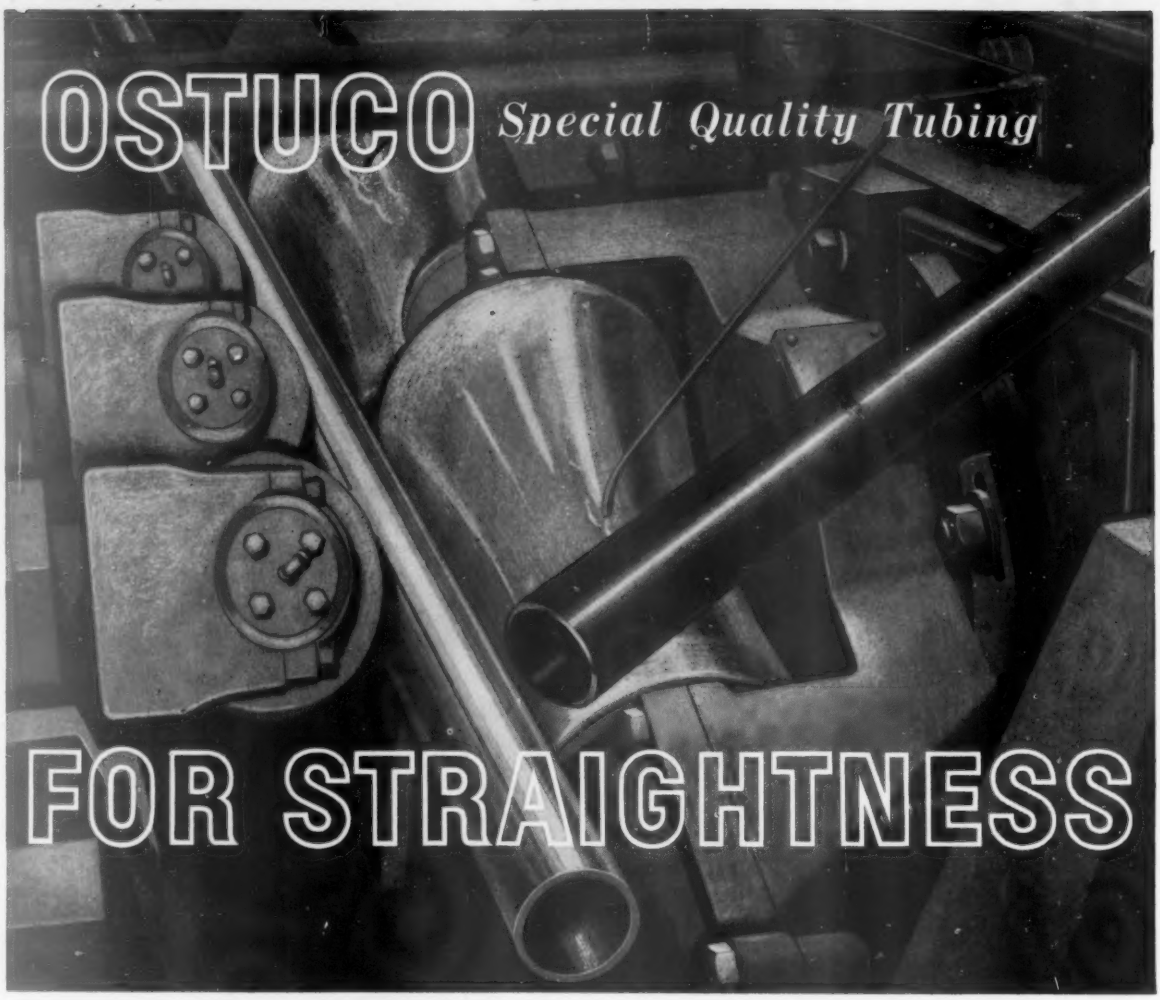
The FRB expectation is that industry will be rebuilding metal inventories which will create a further demand for money. On the other hand, some drop in the level of housing starts is expected next year, and this will reduce the demand for mortgage money.

A major uncertainty is the timing on new plant and equipment spending. Government and private analyses show industry to be planning a substantial increase in capital expenditures. The question is whether expansion will get underway quickly and bulk large in 1960—or whether only the planning phases will take place in 1960 and the actual construction and purchase will pile up in 1961. (Turn Page)



As the Administration makes its final plans for the fiscal 1960 budget this month, Secretary of the Treasury Robert B. Anderson is the key figure. His concern over a balanced budget has dominated Federal planning up to now.

Helicopter Manufacturer Specifies



Straightening **Ostuco Special Quality Tubing** to extremely close limits at Shelby mill.

"Our specifications for seamless steel tubing used in rotor drive shafts are tough to meet. In addition to stringent O.D., wall and concentricity tolerances, we require *special straightness* — tube after tube, shipment after shipment.

"Ohio Special Quality Tubing surpasses any other tubing we have ever used. We know this to be fact. Scrap and rejects are at a new low, inspection OK's and savings on this part are at a new high."

This actual case history may parallel your own product problems. For with Ohio Special Quality Tubing it's only the *quality that's special.* For further information contact our nearest sales office, listed in the Yellow Pages, or the plant at *Shelby, Ohio — Birthplace of the Seamless Steel Tube Industry in America.*

AA-9013

OSTUCO TUBING

OHIO SEAMLESS TUBE DIVISION

of Copperweld Steel Company · SHELBY, OHIO

Be sure to visit Booth 205
Design Engineering Show
May 25-28, Philadelphia

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Los Angeles (Lynwood), Miami, Moline, New Orleans (Chalmette), New York, North Kansas City, Philadelphia (Wynnewood), Pittsburgh, Rochester, St. Louis, St. Paul, Salt Lake City, Seattle, Tulsa, Wichita CANADA: Railway & Power Engr. Corp., Ltd. EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

For More Information Write No. 166 on Inquiry Card—Page 32

Washington Report

These decisions will obviously affect the money market to a considerable degree.

• Balanced Budget Key To Federal Spending

The Treasury Department—under the direction of Secretary Robert B. Anderson—will have a major hand in the policy-making decisions in government, especially during the first six months of the year. The major issues of government must be tied into the budget policy.

In an election year, political considerations suggest two conflicting approaches to government spending. The first is the political wisdom of coming before the electorate with a balanced Federal Budget. The second is a liberal level of public works, which is the life-blood of local politics.

In the development of the budget, the Treasury seeks to develop the tax yield to meet the spending levels established by the Bureau of the Budget. The budget for fiscal 1959—originally (before the steel strike) designed to yield a slight surplus—is now expected to result in a deficit of at least a half billion dollars.

For the fiscal year beginning July 1, the thinking here is that government spending will be at an all-time high for peacetime—roughly $81 billion. It is expected that this level of spending will be more than met by higher tax yields—because of anticipated booming business conditions.

• Military to Get Fewer Items At Same Outlay

The Department of Defense policy on procurement is keyed in to the need for economy. The department will be spending roughly the same amount of money in fiscal 1960, but the costs of each program have gone up due to **A** the creep in prices and **B** the complexity of the units to be bought.

To offset these factors and still live within its budget, the department will:

(1) Make an effort to have companies do as much research and development on their own as possible.

(2) Retain close control over prime contractors' plans to make components in their own plants or buy them from subcontractors. The emphasis, dictated by the desire for economy, will be to find the least expensive way of getting the finished product delivered.

(3) Cut the number of items to be bought, even though total expenditures for military hardware will be the same. There will be a change in allotments to each military service—with the Air Force's procurement funds dropping and the Army's and Navy's increasing over last year. Although fewer numbers will be produced, the added complexity and shorter production runs (plus inflation) will make unit costs climb.

The Defense Department—because it is convinced that no single company has all the know-how to handle development and production of the complicated weapon systems needed in the future—is also promoting the team-bid concept. One firm will be given overall responsibility for producing an end item, but must select its associate contractors with military approval before development work begins.

• Wholesale Price Index To Remain Steady

No new push on prices is anticipated by Bureau of Labor Statistics price analysts. What they see well into next year are the same trends which have now prevailed for almost two years.

There has been a steady drop in farm and farm product prices. In some instances, such as egg prices, the drop has been violent. In contrast, there has been a general rise in the metals and metal products field. The overall wholesale price index for all commodities is now a fraction of a percent higher than twelve months ago.

For next year, a similar trend is expected. Egg prices may firm



SEE THIS MAN for:

Accurate and Durable Collets, Feed Fingers and Pads
with
Prompt Delivery Service
and
Attractive Prices

One Source of Supply
Means Purchasing Economy
Order From **HARDINGE** Today

Collets—Feed Fingers—Pads

FOR: Brown & Sharpe, Cleveland, Cone, Davenport, Greenlee, Acme Gridley, National Acme, New Britain, Warner & Swasey, Jones and Lamson, Gisholt, Bardons & Oliver, Foster, Morey, Simmons, Ames, Atlas, Cushman, Hendey, LeBlond, Pratt & Whitney, Monarch, Bridgeport, South Bend, Kearney & Trecker, Linley, Van Norman, and others.

Shop Proved for Over 65 Years



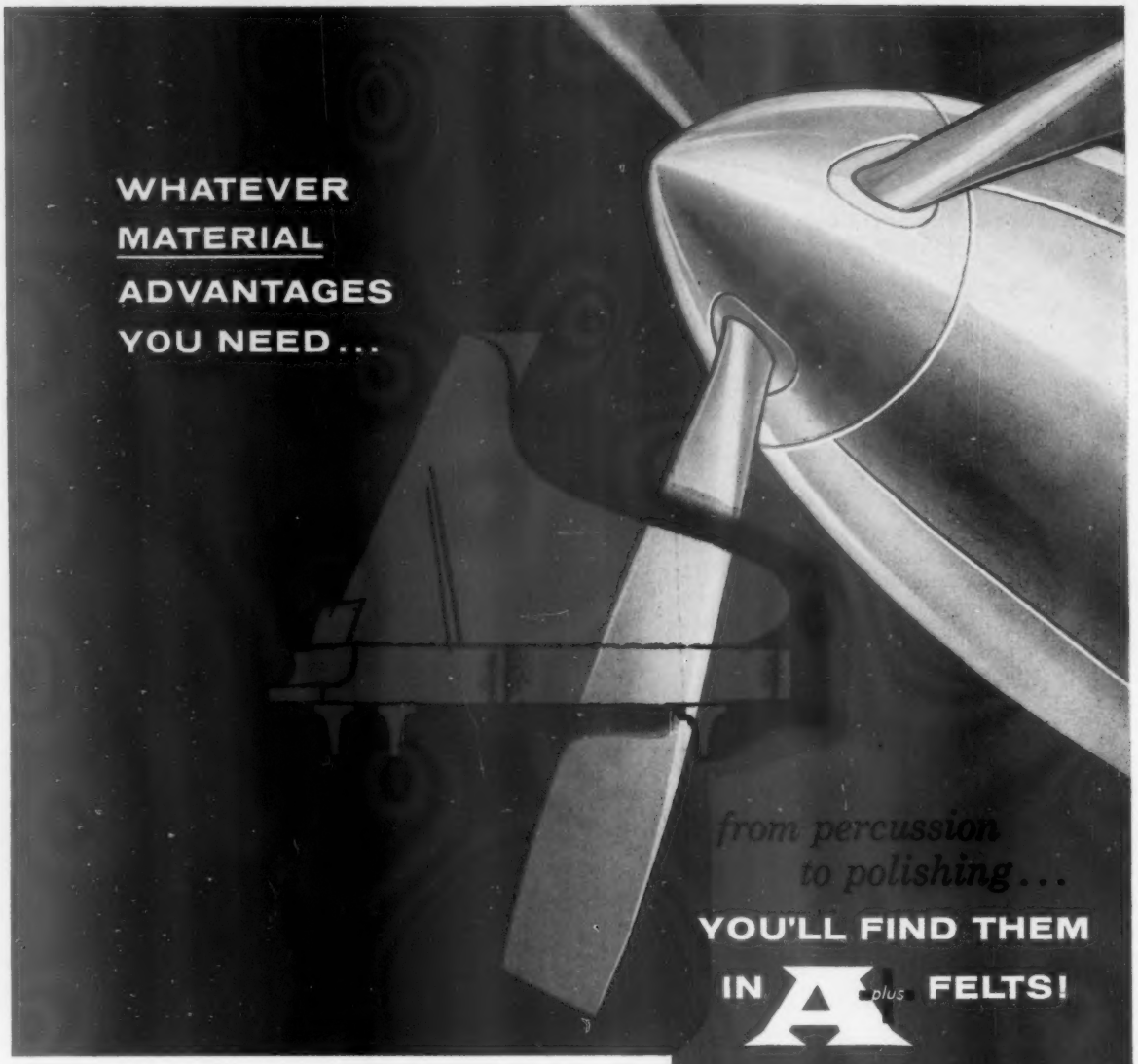
FREE!
"How to Order Collets"

• HARDINGE COLLETS • HARDINGE COLLETS • HARDINGE COLLETS • HARDINGE COLLETS • HARDINGE COLLETS • HARDINGE COLLETS • HARDINGE

HARDINGE BROTHERS, INC.
ELMIRA, N. Y.

Immediate Delivery from Conveniently Located Stocks in:
Atlanta, Boston, Chicago, Dayton, Detroit, Elmira, Hartford, Los Angeles, New York, Philadelphia, Seattle, Portland, Minneapolis, Oakland, St. Louis, Toronto.

For More Information Write No. 167 on Inquiry Card—Page 32



Versatile A+ FELTS ... essential to thousands of purposes ... from the percussion hammers of a concert grand ... to the polished precision of a turbo-prop. In the almost limitless variety and engineered perfection of these materials lies the answer to many a design problem. *Perhaps yours.*

A+ felts are exclusive with American Felt Company. They are used to filter, to cushion, to seal, absorb, cover—and to decorate. They are made as soft as cashmere or as tough as hide. And in felt, the best guarantee of quality is the A+ hallmark. American Felt Company perfected natural wool felts over half a century ago—and pioneered synthetic fiber felts.

There's a way to do a job better *in your plans today*, with an A+ felt. State your problem and our engineers will follow through promptly. Write: Engineering Dept., American Felt Company, 812 Glenville Road, Glenville, Conn.

Among our famous trademarks: **FEUTRON**—synthetic fiber felts; **AAAA BRAND**—piano felts; **WINDSOR**—liquid filters.

American Felt Company

For More Information Write No. 168 on Inquiry Card—Page 32

Washington Report

up from their abnormally low level, but meat and meat product prices will be depressed by large supplies. The general outlook in the food field is for lower prices.

Prices of metals are expected to increase in 1960, spurred on by higher wage settlements and more active demand both in this country and abroad. But the overall index is not expected to be much higher a year from now than it is now.

• Commerce Dept. Sees Better Business In '60

There is a general glow of optimism here about business prospects for next year.

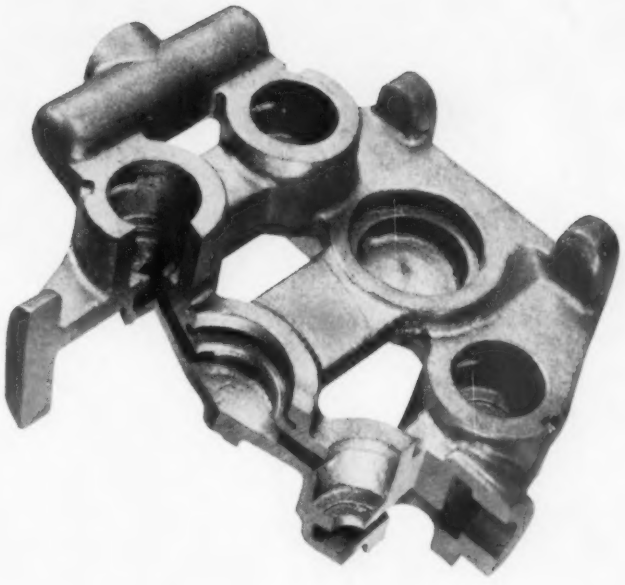
The Department of Commerce sees good signs in the reports of personal income levels. During October, when the pinch of the steel and copper strikes had the greatest impact on wages and payrolls, personal income levels for the nation were still right around the all-time peak.

While wages in metals and metal products were down for the period—and there was also a mild decline in other durable goods payrolls—these drops were offset by wages and salaries paid out by state and municipal governments. Also on the plus side were increases in the payrolls of trade and service industries, higher interest payments, and more income for farm owners.

(European wage rates are also being discussed here. At a recent meeting of the International Metalworkers' Union, European labor spokesmen claimed that manufacturers in Europe don't have a major price advantage stemming from low wage rates.

They said that although their wage rates are lower than the U.S., their fringe benefits are high—averaging 60% of the hourly wage. And they said that their lower productivity was another factor in pushing their prices up.)

One significant factor, as seen by Commerce analysts: if the economy can show such strength during a period of strikes in basic industries, the economic potential for 1960 is much greater than 1959 was.—**A. N. Wecksler**



CAUSTIC SOLUTION

A CASE IN POINT—This is a 19 pound Ni-Resist valve body designed to handle caustic fluids at 400 psi. It was cast for the John Bean Division of Food Machinery & Chemical Corp. Ni-Resist is ideal for this application because it combines high corrosion resistance with superior resistance to erosion from high velocity fluids.

The intricate coring required demands unusual skill to produce Ni-Resist castings leak-proof at 400 psi operating pressures. Hamilton Foundry succeeded in producing pressure tight castings, an accomplishment difficult for the best of foundrymen.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY INC.

1551 LINCOLN AVENUE • HAMILTON, OHIO • TWinbrook 5-7491

For More Information Write No. 169 on Inquiry Card—Page 32





NEW! ANOTHER BIG BONUS IN ALCOA SCREW MACHINE STOCK

NOW! A COMPLETE ALUMINUM SCREW MACHINE STOCK BOOK FOR ESTIMATORS AND OPERATORS

The production of aluminum screw machine parts often calls for a lot of cross-reference table scrambling, complicated formulas to convert steel or brass to aluminum data, and time-consuming computations. Now Alcoa has the solution! For the first time in the screw machine industry, Alcoa makes available a comprehensive *Aluminum Handbook* for estimators and production people. The detailed estimator's section of this fact-filled booklet contains pages of tables to simplify your use of Alcoa® Aluminum. This extensive collection of data will make the toughest screw machining job a cinch to calculate.

Alcoa's handbook contains hundreds of conversions for aluminum screw machine stock, weights of various stock sizes, sfpm at various spindle speeds, weights of stock segments, thread tolerances and weights per 1,000 pieces, among other useful data you'll use every day.

There's also a complete section on *properties and specifications* of aluminum alloys that you'll find a handy reference. A *shop practice* section gives a quick solution for a host of work defects that occur in screw machining.

Your Alcoa man has reserved a copy of this handbook for you. Call the nearest Alcoa sales office or Alcoa Distributor today and he'll bring over your copy and show you how to cut hours off your work. Look for the Alcoa sales or distributor office in the Yellow Pages of your telephone directory under "Aluminum."

And don't forget these many additional bonuses when you deal with Alcoa:

- **Alcoa Aluminum Screw Machine Stock allows up to four times higher cutting speeds than other materials—up to 1,000 surface feet per minute.**
- **Wider range of sizes in standard stock for important price advantages.**
- **Stock in specific 12-ft lengths at no extra cost . . . in rounds to 3⅜ in. and hexagons to 3 in. across flats.**
- **Chamfered ends at no extra cost in a wide range of sizes and alloys.**
- **A guaranteed market for up to 60 per cent of your turnings and borings from four aluminum alloys.**
- **An extensive mill inventory to back up the nationwide distributor stocks and cover emergency requirements of mill customers.**

ALCOA ALUMINUM

Your Guide to the Best in Aluminum Value

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

For More Information Write No. 170 on Inquiry Card—Page 32

Purchasing Follow-up

Restraint of Trade Charged in Steel Bars

The government has charged six steel producers, 12 fabricators, and a trade association with conspiring to eliminate competition in the sale of steel bars in seven Western states. It has brought a suit in San Francisco Federal District Court under Section 1 of the Sherman Antitrust Act—which prohibits combinations and conspiracies in restraint of trade.

A top official of the Justice Department's Antitrust Division told PURCHASING Magazine that its case is based on two primary allegations:

(1) That there is a conspiracy among fabricators to allocate business among themselves through collusive bidding practices.

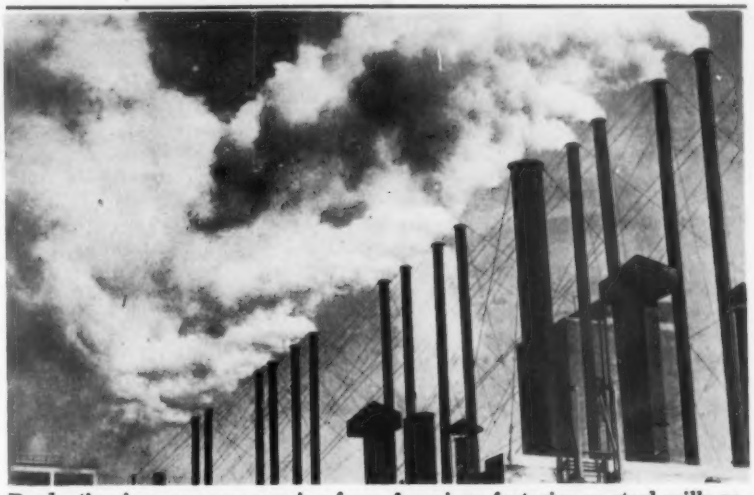
(2) That there is a conspiracy by steel mills and fabricators to artificially allocate channels of distribution of steel bars.

The official noted that this case —which the Department of Justice has been investigating for 15 months—is not the beginning of a new antitrust campaign. But it is, he said, a continuation of the government's long-standing drive against arbitrary, non-competitive distribution. He cited previous suits brought in the electrical and plumbing industries.

Complaints Made

A number of complaints against the steel producers and fabricators have been made by businessmen, but the Justice Department spokesman would not indicate who they were. The government's complaint alleges that the fabricators were aided by their trade association—Western Reinforcing Steel Fabricators Association of Oakland, Calif.—in a number of restrictive policies.

One of the 19 defendents in the suit, U.S. Steel Corp., says "that the steel companies were included as defendents only on the basis of the government's contention that they 'allowed themselves to be induced' by the fabricators to refuse to sell reinforcing bars to general contractors."



Production is once more surging from American factories as steel mills resume volume shipments. But many companies will not be able to recover the sales lost during the 116-day steel strike for many months.

The government action is restricted to Arizona, California, Idaho, Nevada, Oregon, Utah, and Washington. According to the Antitrust Division official, in most other states steel mills sell bars directly to general contractors.

Two categories of relief are requested by the Justice Department in its suit. It wants the fabricators enjoined from dividing markets and carrying on other collusive activities. And it also requests the court to require steel producers to sell reinforcing steel bars directly to contractors.

Credit Exec Cites Services of Wholesalers

The importance of the wholesaler to both manufacturer and customer has been underlined by a leading credit executive.

According to Edwin B. Moran, executive vice president of the National Association of Credit Management, "the wholesaler has contributed materially to orderly expansion of profitable distribution. . . . Years of experience have conclusively proved that the wholesaler is the most economical medium to get many varied items into the hands of the ultimate consumer."

Mr. Moran says that the wholesaler is the right hand of the manufacturer and the retailer. The wholesaler "maintains a warehouse of reserve inventory" which can supply "any needed quantity of general or special merchandise, irrespective of the size or amount, and with rapid delivery."

Another advantage of the wholesaler, says Moran, is that he "is local in operation, remains in the area, and continues to personally contact the retailer during both depression and prosperity periods. If he intends to keep his customers and maintain sales volume, he must, by giving advisory service, help them to survive an adverse economic period."

Wholesalers, he notes, "have an important part in our economy and they are the greatest insurance for continuation of small business. There has been much talk about the need of aiding small business. Such discussions are a waste of time if they are predicated on the misconception that one way to help small business is to eliminate wholesaling.

(Turn Page)



YOU GIVE YOUR DESIGN A LONGER LIFE WHEN YOUR "SPECS" READ HYATT

If you want smooth, trouble-free operation for the life of your design, you can have it with Hyatt! For Hyatt's built-in quality is electronically controlled to insure that the last Hyatt Hy-Roll bearing is just as accurate as the first. Hyatt reliability costs no more so why not have the best? Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

Available through United Motors System and its authorized bearing distributors.

HYATT HY-ROLL BEARINGS

IN ROLLER BEARINGS HYATT IS THE WORD FOR GM RELIABILITY

Purchasing Follow-up

The fact is that no greater contribution can be made to the maintenance of small business than to continue and expand the services of the wholesaler."

Mill Planned to Produce Wide Steel Plates

A new rolling mill will be built in the Chicago area to produce steel plates wider than any now available.

The facility will be constructed by U.S. Steel Corp. in Gary, Indiana. The company says the mill is being built because of "increasing demand for wide plates of improved quality and in larger quantity than now available."

The mill is designed as a combination 160" and 210" wide plate mill. One big advantage of such wide plates is their greater design flexibility, which reduces fabricating costs.

The new mill will be capable of rolling single plates weighing as much as 60,000 pounds. It will be able to produce all grades, including carbon, high-strength, alloy, and stainless steels.

Construction Costs Rise 2% From March-Sept.

Construction costs in the United States, excluding Alaska and Hawaii, rose 2% between March and September of this year, reports F. W. Dodge Corporation.

This average increase is based on building materials prices and hourly wage data from 144 metropolitan areas. Also considered are other cost elements, like design, taxes, insurance, money, and competitive conditions.

Myron L. Matthews, of Dodge's Dow Building Cost Calculator, says "Costs for erecting buildings now average 2.57 times what they did in 1941. The 1941 building dollar has shrunk an average of 3.4 cents in purchasing power annually until now 61 of the original 100 cents have faded away."

Of the two major components of construction measured—materials and labor at the site of construction—labor has again exhibited the greater strength. Labor costs rose in 129 of the 144 areas, decreased slightly in five areas, and remained unchanged in the others. Material prices, on the other hand, did not change in 72 areas, fell in 22 areas, and increased modestly in 50 areas.

Combining both material prices and base hourly wage rates show an increase in 116 areas, no change in 18 areas, and a decrease in ten areas.

Military Contractors Urged to Subcontract

The Department of Defense has ordered companies with military contracts of $1 million or more to subcontract to smaller firms whenever possible. It wants contractors to report such action to the Pentagon.

Previously, reports of subcontracts to Washington were voluntary. About 200 companies had been filing them.

The Defense Department hopes that its mandatory ruling will result in an increase in subcontracting. There are at least 600 contractors that receive research, development, or manufacturing contracts of at least $1 million.

In the first six months of 1959, prime contractors paid subcontractors $1,640,054,000—or 18.2% of their receipts on military contracts. This was up from 17.5% in the last half of 1958 when $1,620,770,000 was paid out.

Mandatory reports will also be required from subcontractors who themselves subcontract to other companies $1 million worth of military orders.

Material Handling Rise Slowed by Steel Strike

The recent steel strike will cost manufacturers of material handling equipment at least 50% of their expected business increase next year, says the president of a leading industrial truck corporation.

W. A. Meddick, president of El-

NEW FROM CONTINENTAL

Electrically welded, leakproof

flaring pails

nest to save storage and shipping costs



Single seam construction



gives leakproof protection for hard-to-hold products

Ideal for liquid roofing cements, paint and petroleum products, dry or powdered materials. Ask your Continental man for details.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd Street, New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4
Canadian Division: 790 Bay St., Toronto, Ont.
Cuban Office: Apartado 1709, Havana

For More Information Write No. 172 on Inquiry Card—Page 32

Service is our best Salesman

"Miss Byrd, I've got a rush order for aluminum. Get me QSM on the phone."

Faster production is only one of the many advantages of QSM Service. Your deliveries are more reliable; quality control is more precise; service more flexible and personal; and there's less red tape to annoy you... that's because your job is completely processed—from hot metal to finished product—in a single, integrated plant. Next time, when you order aluminum, think of Quaker State.



QSM

QUAKER STATE METALS CO. • LANCASTER, PA.

Division of HOWE SOUND COMPANY

Mill Producers of Aluminum Sheet and Coil

For More Information Write No. 173 on Inquiry Card—Page 32

well-Parker Electric Company, says that 1960 sales of material handling equipment had been expected to rise at least 30% over 1959 levels. But he predicts now that business will increase no more than 15%—and only if steel inventories reach a satisfactory level by the end of next month.

"The strike has caused many companies to hold up expected purchases of capital equipment," Meddick notes. "Even if a contract is signed during the injunction period, it will still be necessary to re-stock inventories during the first and second quarters. So it will be the third quarter before business activity returns to pre-strike levels."

Service Centers Suggest Ways to Get More Steel

How can steel service centers help purchasing agents during steel shortages? According to George M. Tinsley, Jr., vice president of Precision Steel Warehouse, Inc. of Chicago, warehouses will be of great value to P.A.'s in the first half of 1960 if they follow these suggestions:

(1) Submit requirements for the next three to six months to insure that the right tonnages and grades will be available when needed.

(2) Submit a list of any obsolete tonnages. This steel can be converted quickly to needed sizes by slitting, shearing, cutting-to-length, and edging.

(3) Determine if any substitutions are possible. Service centers still have large tonnages of less popular grades. Sometimes a slight tooling modification will accommodate changes in steel temper, gage, size, or grade.

(4) Consider substitution of aluminum, which is in plentiful supply at steel service centers. Aluminum stampings, structural components, and extrusions will often substitute for steel with no loss of quality.

(5) Consider shipping coils purchased from mills to service centers. There the coil can be processed to the varying sizes and shapes required for production.

Power Company generates good will with COTTON*



*Fairfax toweling used by Arkansas Power & Light is supplied by Independent Linen Service Co., Little Rock, Ark.

• As a major supplier of electricity to Arkansas, the Arkansas Power & Light Company depends greatly on the efficiency and morale of its employees. Customer good will, too, is an important concern. That's why, in its new Little Rock office building and more than a dozen other locations, the company uses cotton toweling.

Employees and customers have both indicated their preference for cotton—and management likes it as much as they do. Cotton toweling saves on housekeeping expenses. It eliminates litter and fire hazard in wash rooms. And cotton toweling is easier to service, too.

Why not find out how you can benefit with cotton toweling. For further facts, write for free booklet to Fairfax, Dept. S-12 111 West 40th St., New York 18, N. Y.



Here's How Linen Supply Works...

You buy nothing! Your linen supply dealer furnishes everything at low service cost—cabinets, pickup and delivery, automatic supply of freshly laundered towels and uniforms. Quantities can be increased or decreased on short notice. Just look up LINEN SUPPLY or TOWEL SUPPLY in your classified telephone book.

Clean Cotton Towels...

Sure Sign of Good Management

Fairfax·Towels WEST POINT TEXTILES

WELLINGTON SEARS COMPANY, 111 WEST 40TH STREET, NEW YORK 18, N.Y.

For More Information Write No. 174 on Inquiry Card—Page 32

The "EASIEST-TO-USE" Skid and Pallet Trucks for loads up to 6000 lbs.

AMERICAN



The finest hand-lift trucks that skillful engineering, fine materials and advanced design can produce. Separate, easy-to-use hydraulic lifting handle. Independent pulling and steering handle makes "cornering" impossible.

Load-Lift
PALLET TRUCKS

Load-Lift
SKID TRUCKS



Expert materials handling planning service is yours through your local American Distributor. His in-stock delivery service will save you time and money.

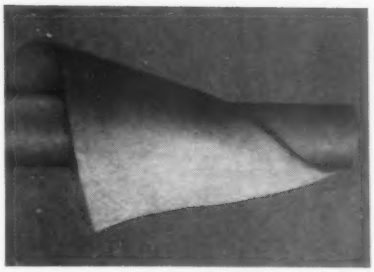
MATERIALS HANDLING DIVISION

THE AMERICAN PULLEY COMPANY

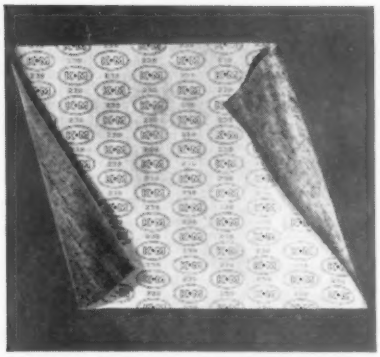
4200 WISSAHICKON AVENUE • PHILADELPHIA 29, PA.

For More Information Write No. 175 on Inquiry Card—Page 32

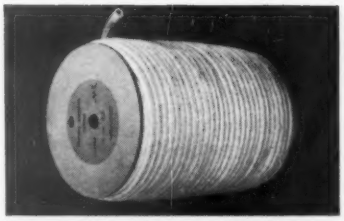
K&M BUYER'S GUIDE TO BETTER ASBESTOS PRODUCTS

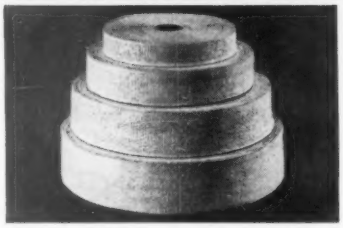


For manufacturing folded asbestos gaskets—*"K&M" Style 93-T and Style 94 Asbestos Gasket Cloth!* "K&M" Style 93-T is made of high-grade asbestos yarn and fine brass wire, twisted and woven, then coated with a rubber friction compound. You'll find that it remains soft and pliable. Style 20-C is identical to Style 93-T, except that it's designed to meet Military Specification MIL-P-1233.

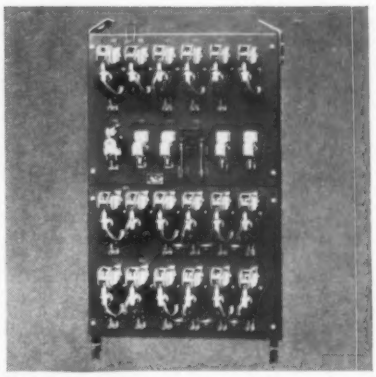


"K&M" Compressed Asbestos Sheet Packings for a wide range of industrial applications! "K&M" produces an extensive line of sheet packings for use against air, steam, water, gas, hot oils, and gasoline. For high, medium, and low temperatures. Buna-S, Buna-N, and sulfur-free neoprene sheets are available. "K&M" Sheet Packings are quality-controlled and tested for compression and recovery, tensile strength, flexibility, and resistance to oils and solvents. They satisfy most Government specifications.





For insulation of wires, cables, coils, and transformer leads—*"K&M" Asbestos Tapes and Tubing!* Fireproof and flexible, "K&M" Asbestos Tapes insulate wires, coils, and cables. Nonferrous tapes for high voltages. Ferrous tapes for high temperatures. "K&M" Braided Asbestos Tubing protects wires against heat and chemicals. Insulates electric coil and transformer leads. Extremely flexible.



Ideal insulating material for mounting electrical apparatus—*"K&M" Ebonized Asbestos!* For switchboards, bus bar supports, cabinets, compartment linings, bench boards, and testing tables. "K&M" Ebonized Asbestos withstands severe shocks and vibrations, and is unaffected by rapid temperature changes. Lightweight. Exceptionally high dielectric strength. Uniform density. And it's not only long-lasting, but actually becomes tougher with age.

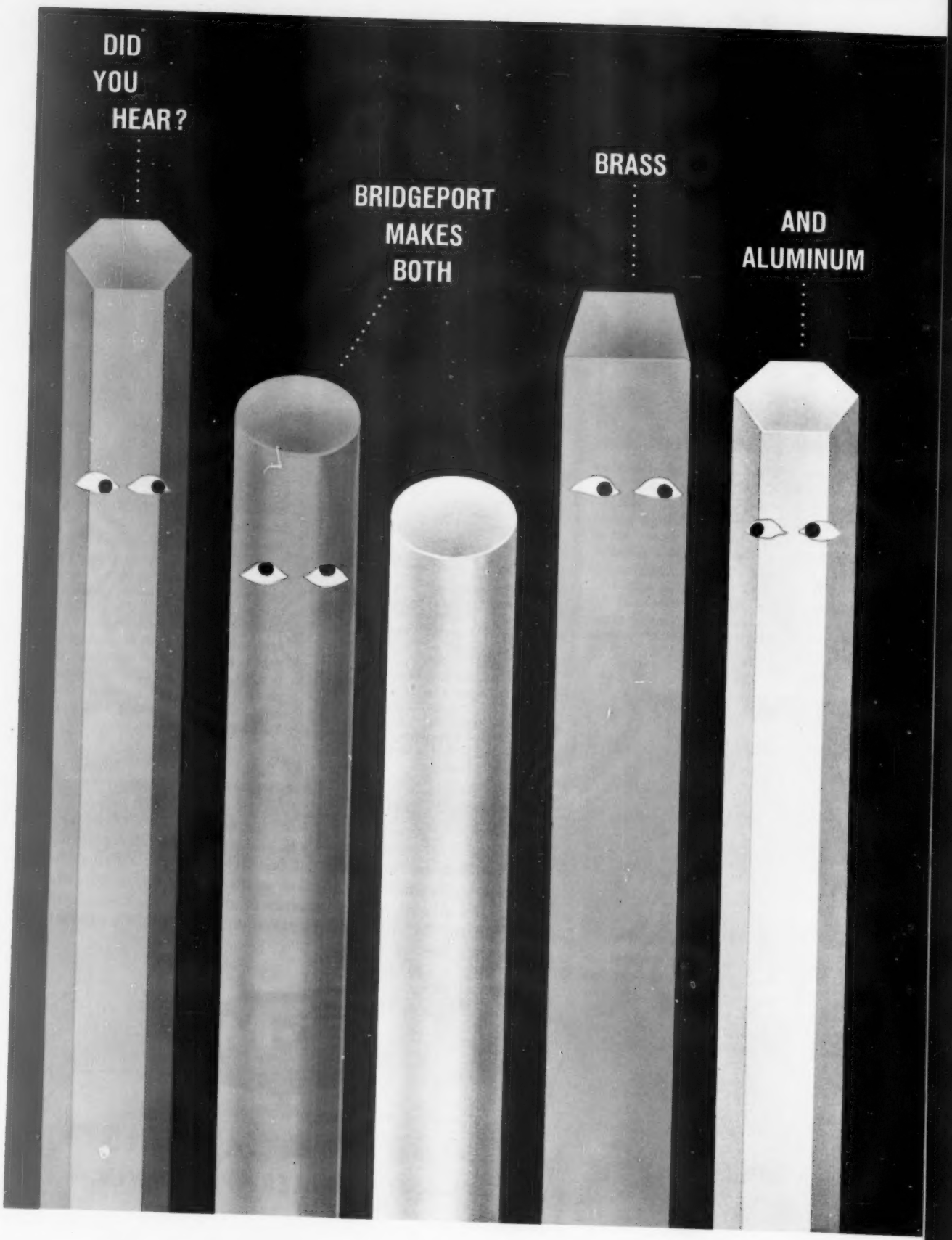
No Johnny-come-lately, "K&M" has supplied quality asbestos products of all types to U. S. industry for over eighty-five years. During that period, it has fully met and satisfied the exacting requirements of many industrial giants. That's why you can rely on the performance of any "K&M" product you purchase. For more information on any "K&M" product, please write to us.

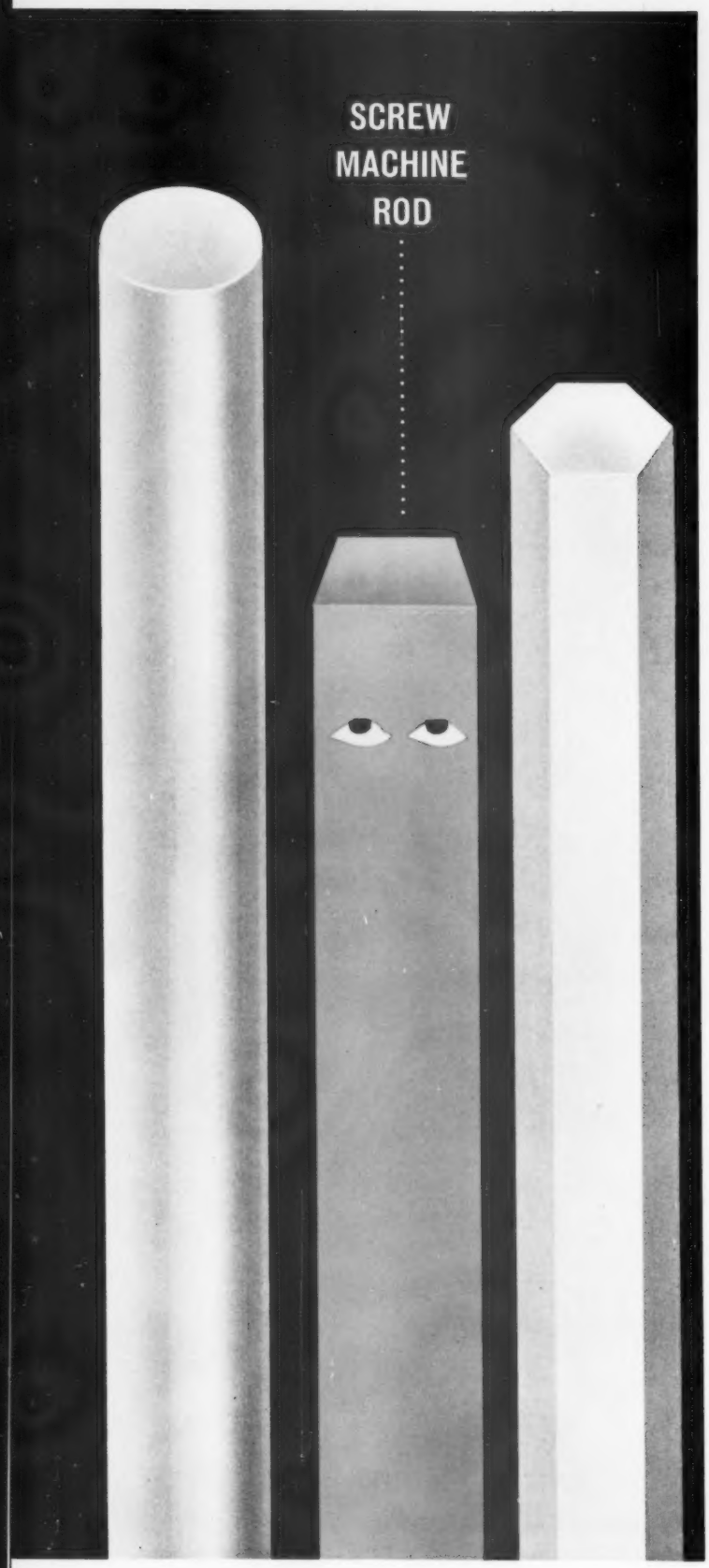
K·M
BEST IN ASBESTOS

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

For More Information Write No. 176 on Inquiry Card—Page 32

For More Information about ad on following page Write No. 177 on Inquiry Card—pg. 32→


DID
YOU
HEAR?
BRIDGEPORT
MAKES
BOTH
BRASS
AND
ALUMINUM



BUY BRIDGEPORT SCREW MACHINE ROD

Bridgeport has no "metal axe" to grind. We recognize that for some applications aluminum is better... for others, brass is best. Our one objective is *to give you the most suitable material for your specific needs.* That's why you can always rely on the advice of your Bridgeport Salesman—he knows your screw machine needs and can give you the same high quality rod in aluminum or brass. He's backed by our 92 years of metals know-how and our pioneering work in developing high speed rods for the screw machine industry.

He can give fast service, too, because Bridgeport stocks both aluminum and brass screw machine rod in warehouses and mills throughout the country for immediate delivery. For full details, call your nearest Bridgeport Sales Office, or, write directly to Bridgeport Brass Co., Bridgeport 2, Conn. Dept. BA3

ALUMINUM SCREW MACHINE ROD

TYPES	Round and Hexagon.
SIZES	Diameters in 1/64" increments from 1/2" to 3" in standard 12-foot lengths.
ALLOYS	2011-T3 (Standard temper—heat treated and drawn) 2011-T8 (For applications requiring deep drilling—HT-Drawn-Aged) 2017-T4 (For applications requiring high strength) 6061-T6 (For applications requiring superior corrosion resistance) 2024-T4 (Heat treatable—for applications requiring high strength)

BRASS SCREW MACHINE ROD

TYPES	Round, half-round, oval, square, rectangular, hexagonal and special shapes.
SIZES	Diameters from 1/16" through 4-1/2".
ALLOYS	Free Cutting Brass; Leaded Commercial Bronze; Tellurium Copper; Sulphur Bearing Copper; Hardware Bronze; Leaded Muntz Metal; Leaded Naval Brass; Aluminum Bronze; Free Cutting Phosphor Bronze; Nickel Silver.

BRIDGEPORT TECHNICAL SERVICE is always ready to help you use metals to your best advantage—in reducing costs, improving alloys or solving your production problems on both brass and aluminum. Ask your Bridgeport Salesman or write to us direct for more details.

BRASS Bridgeport CO.

BRIDGEPORT BRASS COMPANY

Bridgeport 2, Conn. • Sales Offices in Principal Cities

Specialists in Metals from Aluminum to Zirconium

. . . FAST, UNIFORM PROCESSING — 1960 . . .

CAMBRIDGE METAL-MESH BELTS are the answer to the big problems you'll face in the competitive 60's—tighter operating costs, higher production and consistent quality.

Continuous movement of foods, metal parts, ceramics or chemicals on Cambridge Belts through processing operations speeds production and eliminates costly manual handling. Open mesh construction allows heat, cold or liquids to flow through the belt and around the product for thorough, uniform treatment. Superior belt design and manufacturing techniques mean longer life, fewer repairs, lower operating costs.

Belts can be made heatproof, coldproof or acidproof — in any mesh, weave, metal or alloy — with any side or surface attachments.

Have your Engineering Department call the Cambridge Field Engineer in your area. He'll be glad to discuss any aspect of Cambridge Belts — from manufacture to installation and service. He's listed in the yellow pages under "Belting, Mechanical". Or, write for FREE 130-PAGE REFERENCE MANUAL.



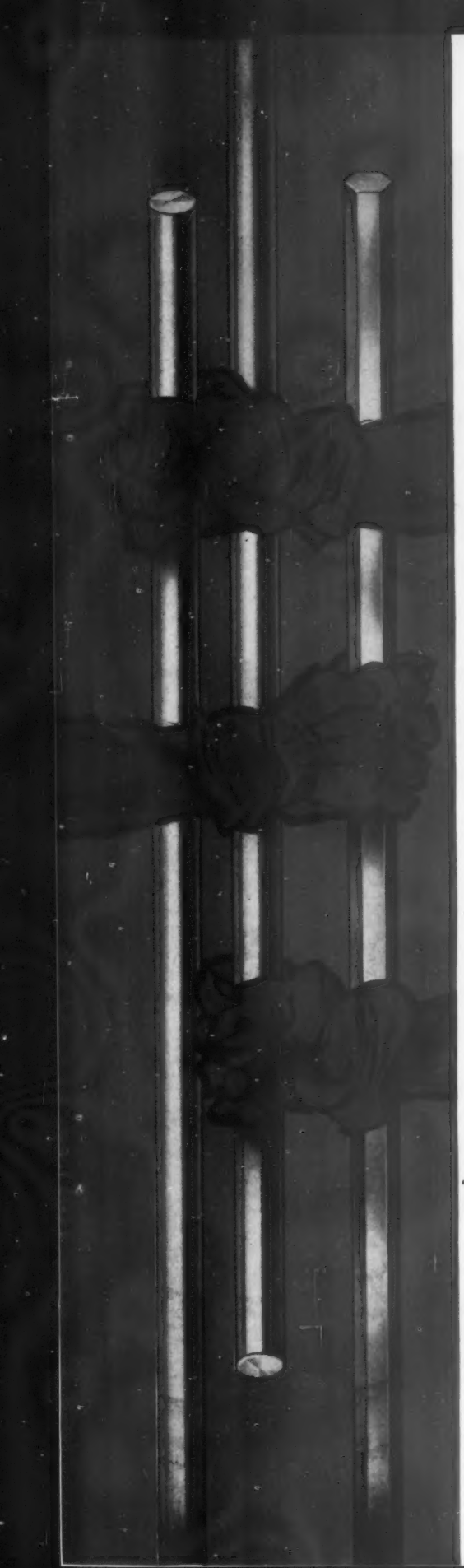
The Cambridge Wire Cloth Co.

Department AK • Cambridge 12, Md.

Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications

For More Information Write No. 178 on Inquiry Card—Page 32

For More Information about ad on facing pg. Write No. 179 on Inquiry Card—pg. 32→



An announcement of interest to manufacturers of steel parts

Improvements in today's STRESSPROOF STEEL BARS WITH COPPER

1 **100,000 PSI YIELD STRENGTH** in all sizes . . . without heat treating.

2 **IMPROVED PHYSICAL PROPERTIES...** better fatigue life wearability, and resistance to atmospheric corrosion. Over-all quality is improved.

3 **IMPROVED MACHINABILITY...** STRESSPROOF with copper now machines faster and better than ever. It gives longer tool life, better finish, and more production from a day's run, according to shop production records.

4 **CLOSER TOLERANCES...** Tolerances for rounds have been tightened to meet the need for more precise parts as follows:

¼" to 1½"	Over 1½" to 2½"	Over 2½" to 3⅜"
+.000 −.004	+.000 −.005	+.000 −.006

5 **COMPARED WITH OTHER STEELS, STRESSPROOF COSTS EVEN LESS TODAY...** Also saves machining and heat treat costs, and you get a better quality part. It will pay you to take another look at this improved material.

Your STEEL SERVICE CENTER stocks contain today's STRESSPROOF. It has been produced and shipped over a several months' period.

JUST PUBLISHED! Use this coupon to request your copy of new bulletin, "Improvements in Today's STRESSPROOF Steel Bars."



La Salle STEEL COMPANY

1432 150th Street, Hammond, Indiana

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

WAGNER Integral-Type Gearmotors



FOR THE POWER YOU WANT AT THE SPEED YOU NEED

Wherever you need "slower than motor speeds" you can get positive speed reduction with plenty of power by using Wagner Gearmotors.

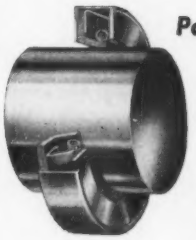
This extension to the Wagner line provides compact motorized drives, with both motor and gear housing of corrosion-resistant cast iron. Available with the latest NEMA Frame open protected or totally enclosed fan-cooled motors, they combine Wagner motor dependability with rugged, simplified gear units to give you speed reduction equipment designed for greater capacity and longer life in ordinary up to rough service.

Wagner Gearmotors offer a wide variety of sizes in single, double, triple or quadruple reductions, horizontal or vertical foot or flange mountings—speeds from 7½ to 780 RPM. Write for Bulletin MU-227.

Whether you specify or apply power transmission equipment, your nearby Wagner Sales Engineer will be glad to help you select the right drive for your applications.

Heat treated high capacity helical gears

Gears are hardened after cutting, for maximum hardness and accuracy, to give extra capacity and longer wear life.



Positive Oil Seals

Improved lip type seals are used on horizontal shafts. On vertical output shafts, double mechanical seal with slinger and drain-off gives positive protection against leakage.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WH59-12

Wagner Electric Corporation

6360 Plymouth Ave., St. Louis 14, Missouri.

SERVING 2 GREAT GROWTH INDUSTRIES . . . *ELECTRICAL* . . . *AUTOMOTIVE*

For More Information Write No. 180 on Inquiry Card—Page 32

QUICK COMPARISON CHART

Some unique combinations of electrical and physical properties in Anaconda metals that may save you money—handle tough jobs better

Properties shown for precipitation-hardened condition—Heat-treatable alloys	ELECTRICAL CONDUCTIVITY % IACS	TENSILE STRENGTH psi	YIELD STRENGTH at 50% ext. under load, psi	ELONGATION % in 2 in. or 4xD	MACHINABILITY compared with F.C. Brass at 100	FORMS AVAILABLE
Chromium Copper-999 (Cu 99.05%, Cr .85%, Si .10%)	75	65,000	55,000	20	20	Rod Wire Tube Forgings Strip
Leaded Nickel Copper-831 (Cu 97.8%, Pb 1.0%, Ni 1.0%, P .2%)	55	80,000	70,000	7	80	Rod
Cunisil-837 (Cu 97.5%, Ni 1.9% Si .6%)	30 to 42	90,000	70,000	8	40	Rod

To give you a basis of comparison, here are properties of two standard Anaconda electrical coppers

ETP Copper—100 (Cu 99.9+%)	100	48,000	40,000	15	20	All mill forms
Leaded Copper—126 (Cu 99.0%, Pb 1.0%)	98	48,000	40,000	12	80	Rod bar

The values given above are intended as a guide to some unusual combinations of electrical and physical properties available among Anaconda alloys. If any of them gives you an idea for possible solution to a tough problem or indicates a way to cut costs without sacrificing quality or performance — see your American Brass representative for more details. Or send in this coupon today.

5949

COPPER • BRASS • BRONZE • NICKEL
SILVER MILL PRODUCTS

ANACONDA®

PRODUCTS

Made by The American Brass Company

The American Brass Co., Waterbury 20, Conn.
In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

Please send me more information about the following alloys:

- ☐ Chromium Copper–999
- ☐ Leaded Nickel Copper–831
- ☐ Cunisil–837
- ☐ Leaded Coppers
- ☐ Electrolytic Tough Pitch Copper–100

Name .....

Company .....

Street .....

City ..... Zone .... State .....

For More Information Write No. 181 on Inquiry Card—Page 32

BLEACHED KRAFT CONVERTING PAPERS



Why do so many leading converters insist on famous GATOR HIDE® bleached kraft?

THE world's leading converting paper didn't get that way by accident. Here's why Gator Hide kraft has become so famous.

Made to exact specifications. Every Gator Hide bleached converting grade is produced to exact specifications. These have been developed both through research in our own laboratories and close cooperation with converters.

Quality—first, last and always. One company, International Paper, controls quality from forest to you. Virgin sulphate pulp assures maximum strength, appearance, and printability.

Complete line. International Paper makes bleached converting papers for: multiwall bags, printing, specialty bags and wrapping papers, coating, laminating, waxing—many other uses.

Enormous productive capacity. International Paper, world's foremost producer of pulp, paper and paperboard products, has long been *"Your most dependable source of supply."*

Aren't these all good reasons for *insisting* on this famous brand?



Southern Kraft Division **INTERNATIONAL PAPER** New York 17, N. Y.

SNAP-LOCK Limit Switches

Actuate Two Circuits Simultaneously ...Without Special Linkage



The D-2400 series Snap-Lock Limit Switches with two normally open and two normally closed contacts permit making or breaking two individual circuits simultaneously. Mounting problems are simplified, special linkages eliminated and costs kept to a minimum.

Snap-Lock Limit Switches were originated by National Acme to meet the severe mechanical and electrical conditions imposed by all types of machine tools. The outstanding simplicity and ruggedness of these water and oil tight switches make them adaptable to the toughest heavy-duty assignments.

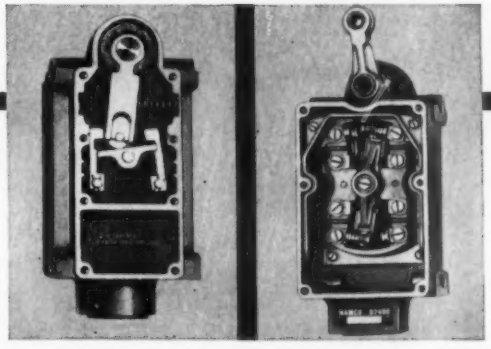
Four basic models with a wide variety of actuating levers will handle up to 5 amps, 600 volts, AC. For complete details, parts list, and scale drawings, write for Bulletin EM-5824.

National Acme

THE NATIONAL ACME COMPANY
191 E. 131st STREET
CLEVELAND 8, OHIO

Sales Offices: Newark 2, N. J., Chicago 6, Ill., Detroit 27, Mich.

MECHANICAL SIDE ELECTRICAL SIDE



All Snap-Lock switches have separate enclosures within a single housing for the mechanical and electrical sides. Ample wiring space is provided and maintenance greatly simplified.

For More Information about ad on facing pg.
←Write No. 182 on Inquiry Card—pg. 32

For More Information Write No. 183 on Inquiry Card—Page 32

UNION STAINLESS STEEL

Fight corrosion with this lineup

UNIONWELD
Pipe

UNIONDRAWN
Pipe & Tubing

UNIONSEAMLESS
Pipe & Tubing

UNION 20-S
Pipe, Tubing, Strip, Sheet, Plate, Bar

Complete range of 300-Series Stainless analyses available. Contact your local Union Steel Distributor.

leadership through research

UNION STEEL CORPORATION

UNION, NEW JERSEY • MUrdock 7-2000

STAINLESS and SPECIALTY STEELS - exclusively

For More Information Write No. 184 on Inquiry Card—Page 32

MODERN DROP-THROUGH METHOD SPEEDS DIE-CASTING PRODUCTION BY 50%

Brown-Lipe-Chapin eliminates manual handling with mechanical ejection of hot die castings.



Here's a typical example of how Brown-Lipe-Chapin engineers put quality into your die cast parts.

After the die casting cycle, castings are ejected automatically into a quench, where a conveyor takes them to the trim press. This modern method of die casting allows a maximum operating rate and boosts the over-all production rate by 50%. Also, casting uniformity is assured because the cycle time is constant and unaffected by operator fatigue or other human factors.

This is just one of the many outstanding features of Brown-Lipe-Chapin die casting facilities that can help make your product better and to more rigid quality standards.

Under the same roof are facilities for metal stamping, anodizing, electroplating, buffing and polishing, precision painting, plus complete engineering service. And two Brown-Lipe-Chapin plants, strategically located in Elyria, Ohio and Syracuse, New York, offer the same complete facilities. For further information, call or write Brown-Lipe-Chapin, Syracuse, New York.

GM GENERAL MOTORS

RELIABILITY by BROWN·LIPE·CHAPIN

DIVISION OF GENERAL MOTORS CORPORATION

For More Information Write No. 185 on Inquiry Card—Page 32

Information For Your Catalog Files

ALUMINUM ALLOYS

A 12-page illustrated brochure describing aluminum alloys and extrusions. Gives information on mechanical properties, recommended uses, and reference numbers. Discusses basic types, standard tolerances, and prices.

Precision Extrusions, Inc.

Write No. 1 on Inquiry Card—Page 32

BELT CONVEYORS

Bulletin 458 describes pre-engineered sectional belt conveyors. Features technical data, advantages, and exploded views.

Stephens-Adamson Mfg. Co.

Write No. 2 on Inquiry Card—Page 32

CIRCUIT BREAKERS

Bulletin 3-450 covers air circuit breakers for use in metal-clad switchgear. Gives information on applications, construction details, and breaker and cell design. The illustrated two-color catalog also has a description of the housing interior.

Federal Pacific Electric Co.

Write No. 3 on Inquiry Card—Page 32

COUPLINGS

A bulletin on cast-aluminum couplings for joining extruded aluminum steam-traced piping. Drawings illustrate three basic types.

Alcast Fittings

Write No. 4 on Inquiry Card—Page 32

ELECTRICAL INSULATING VARNISHES

A catalog on selection and application of electrical insulating varnishes. The 35-page bulletin includes charts, graphs, and illustrations. Covers temperature conversion, solvents, specific gravity, and viscosity.

Minnesota Mining and Manufacturing Co.

Write No. 5 on Inquiry Card—Page 32

INDUSTRIAL TRUCKS

A six-page folder on heavy duty industrial trucks. Describes features and specifications of four electric vehicles. The design of axles, motors, controls, brakes, and frame is discussed and illustrated.

Elwell-Parker Electric Company

Write No. 6 on Inquiry Card—Page 32

NYLON

An eight-page brochure on nylon stock shapes. The bulletin gives data on moisture conditioning, machining, bonding, and welding of parts. Physical properties of four available grades are charted.

Cadillac Plastic & Chemical Company

Write No. 7 on Inquiry Card—Page 32

POWER CONNECTORS

A 12-page catalog on rectangular power connectors. Specifications, outline dimensions, illustrations, and general information are included.

De-Jur Amsco Corporation

Write No. 8 on Inquiry Card—Page 32

POWER TRANSFORMERS

Bulletin GEA-6604A describes power transformers rated from 12,000 to 250,000 KVA. The 44-page publication contains outline drawings, cooling arrangements, and application information.

General Electric Company

Write No. 9 on Inquiry Card—Page 32

PULLEYS

Bulletin SL-1 covers a line of spring loaded pulleys and adjustable motor bases. The illustrated catalog includes selection charts, specifications, and engineering data.

Maurey Manufacturing Corporation

Write No. 10 on Inquiry Card—Page 32

SEPARATORS

Bulletin S.A1129-8-59 describes self-opening centrifugal separators. The two-color catalog features photographs, specifications, and dimensions.

De Laval Separator Company

Write No. 11 on Inquiry Card—Page 32

SHEAVES

Bulletin No. 8102 describes variable speed sheaves with resilient cam-follower design. The eight-page two-color catalog shows sheave construction by a cutaway photo and diagram. Tables facilitate selection of companion sheaves and belts to meet specified drive requirements.

T. B. Wood's Sons Co.

Write No. 12 on Inquiry Card—Page 32

For More Information about ad on following page Write No. 186 on Inquiry Card—Page 32→



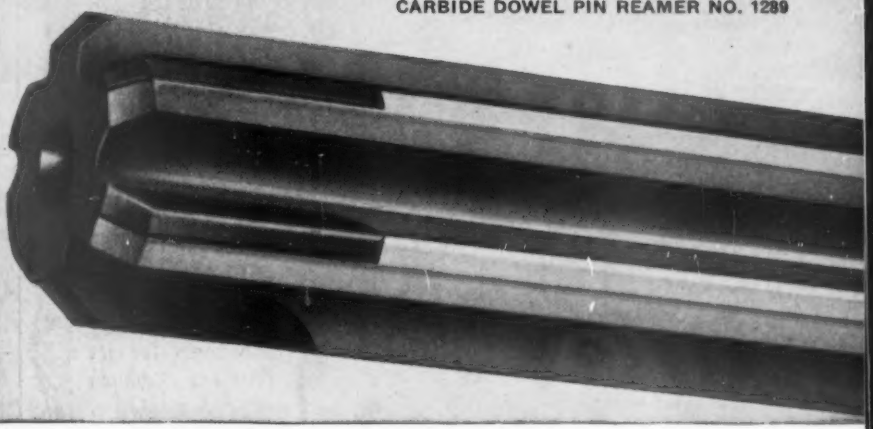


CARBIDE DIE DRILL NO. 1500

Reduce Tip Failures with W & B Perma-Braze Carbide Tools



CARBIDE DOWEL PIN REAMER NO. 1289



CALL YOUR WHITMAN & BARNES DISTRIBUTOR FOR...

RELIABLE ENGINEERING SERVICE

COMPLETE IN-STOCK SELECTION

PROMPT DELIVERIES

INDUSTRIAL DISTRIBUTORS — SERVING INDUSTRY ECONOMICALLY — THE RIGHT HAND OF PRODUCTION

FREE LITERATURE
on carbide tools—write today!

Perma-Braze is an advanced process pioneered and perfected by Whitman & Barnes that enables carbide tips to be brazed with a specially developed high temperature alloy at the same time the high speed bodies are hardened. The result is uniform body hardness and carbide tips that will not loosen due to braze melting. Your payoff is greatly reduced tip failures . . . less machine down-time . . . longer tool life. You get lower tooling costs *and* a more efficient operation. Ask your W&B distributor about Perma-Braze carbide tools today!

W&B

END MILLS • COUNTERSINKS • COUNTERBORES • CARBIDE TOOLS • SPECIAL TOOLS



WHITMAN & BARNES

"MAKERS OF FINE TOOLS SINCE 1848"

DRILLS AND REAMERS

40015 PLYMOUTH ROAD • PLYMOUTH, MICHIGAN

NEW YORK CHICAGO LOS ANGELES



quality control of WELDMENTS and COMPONENTS by LAVELLE

Quality control of precision sheet metal components for jet engines, missiles, air frames and similar end products demands the total resources of qualified men, methods and machines. At Lavelle, experienced craftsmen use a variety of inspection techniques and equipment at every stage of production . . . from tool control to final piece inspection . . . to maintain quality control of critical parts to exacting specifications.

Lavelle specializes in producing weldments and assemblies made of titanium, aluminum, magnesium, stainless steel and nickel alloys. X-ray, Zyglo, and Magnaflux methods of non-destructive inspection are certified and used to control material and weld quality. Close supervision by Lavelle inspection specialists assures consistent component quality . . . at a cost related to your standards.

Quality control procedures employed by Lavelle are outlined in a new brochure describing Lavelle's manufacturing services. Write for your copy today.

Lavelle

LAVELLE AIRCRAFT CORPORATION • NEWTOWN, BUCKS COUNTY, PA.

Between Philadelphia, Pa., and Trenton, N.J.

For More Information Write No. 187 on Inquiry Card—Page 32

Catalog Files

STEEL BARS

A bulletin on cold finished carbon steel bars. Stock sizes and shapes of over 20 different kinds of leaded bars are shown, along with comparative data on strength, workability, machinability, heat treatment response, and cost.

Joseph T. Ryerson & Son, Inc.

Write No. 13 on Inquiry Card—Page 32

TIME DELAY RELAYS

Bulletin No. 376-100REV describes 18 standard electronic time delay relays. The eight-page catalog covers factory preset, internally adjustable, and externally adjustable units.

Master Specialties Company

Write No. 14 on Inquiry Card—Page 32

TUBING

A bulletin describing electricweld cylinder tubing. O.D. and I.D. tolerances and mill test and burst pressure psi are given for the different sizes covered.

Jones & Laughlin Steel Corporation

Write No. 15 on Inquiry Card—Page 32

VALVES

A "buyers guide" to valves. Contains a list of frequently used abbreviations, a valve trim chart, and figure number descriptions. Valves are classified by type, disc design, seating arrangement, stem operation, bonnet, and end connection.

Ohio Injector Company

Write No. 16 on Inquiry Card—Page 32

VIBRATING SCREENS

An illustrated bulletin on mechanical conveyor type vibrating screens. Contains descriptions, specifications, and data for three standard models.

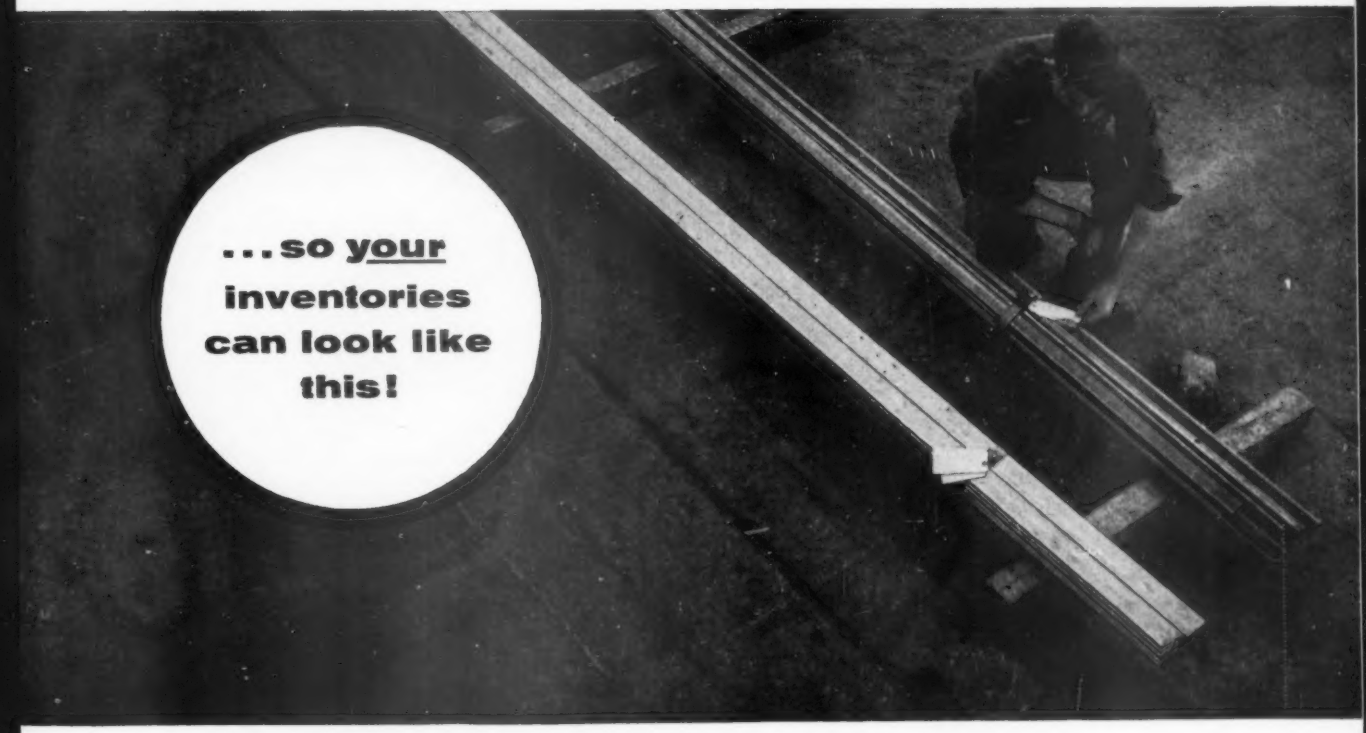
Syntron Company

Write No. 17 on Inquiry Card—Page 32

For More Information about ad on facing page Write No. 188 on Inquiry Card—pg. 32→



Photos courtesy of The Universal Steel Company



To cut inventory costs, make your Youngstown Warehouser your local "steel service center". Make full use of his complete local stocks, fast delivery service. His one-source service simplifies your purchasing and bookkeeping, too. You'll find him an efficient, time-saving, partner-in-production.

AMERICAN STEEL WAREHOUSE ASS'N

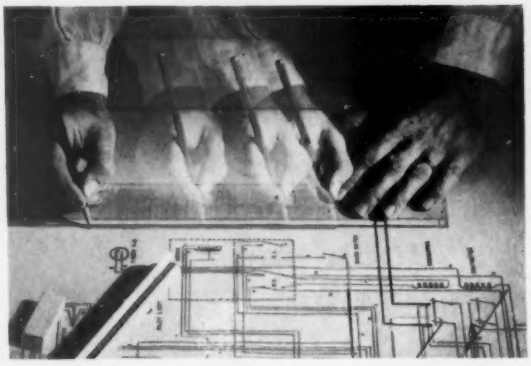
THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Youngstown, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel

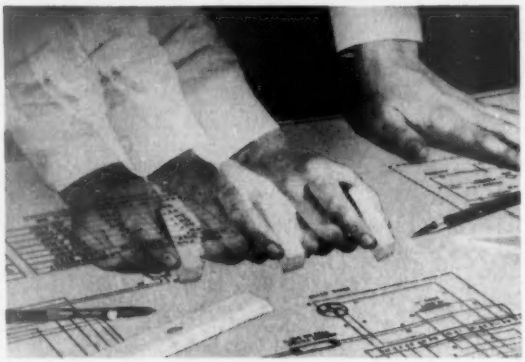
NEW! CRONAFLEX® DRAFTING FILM

The best surface on the toughest base . . . made and controlled by Du Pont from start to finish.

1 CRONAFLEX Drafting Film has excellent pencil acceptance. Its superb matte surface accepts printing and drafting inks.



2 CRONAFLEX Drafting Film erases easily, without ghosting, yet there is less smudging. It comes matted one or two sides, and is available in either rolls or sheets.



3 CRONAFLEX Drafting Film is .004" thick, which has been found to be ideal for drafting. Its rugged CRONAR* polyester film base will take repeated handling and countless trips through your reproduction machine and to and from your file drawer without cracking or becoming brittle. It lies flat, holds size, is flexible and impervious to moisture.



CRONAFLEX Drafting Film is the first product of its kind which is made in its entirety by a single manufacturer. The benefits can be summed up in two words: quality control. We control the manufacture of both base and surface, and we control the method by which they are made into the best drafting film you can buy.

This means that every sheet of CRONAFLEX Drafting Film has the same excellent pencil acceptance, the same erasability, the superb matte surface, the .004" thickness which has been found ideal for drafting and filing.

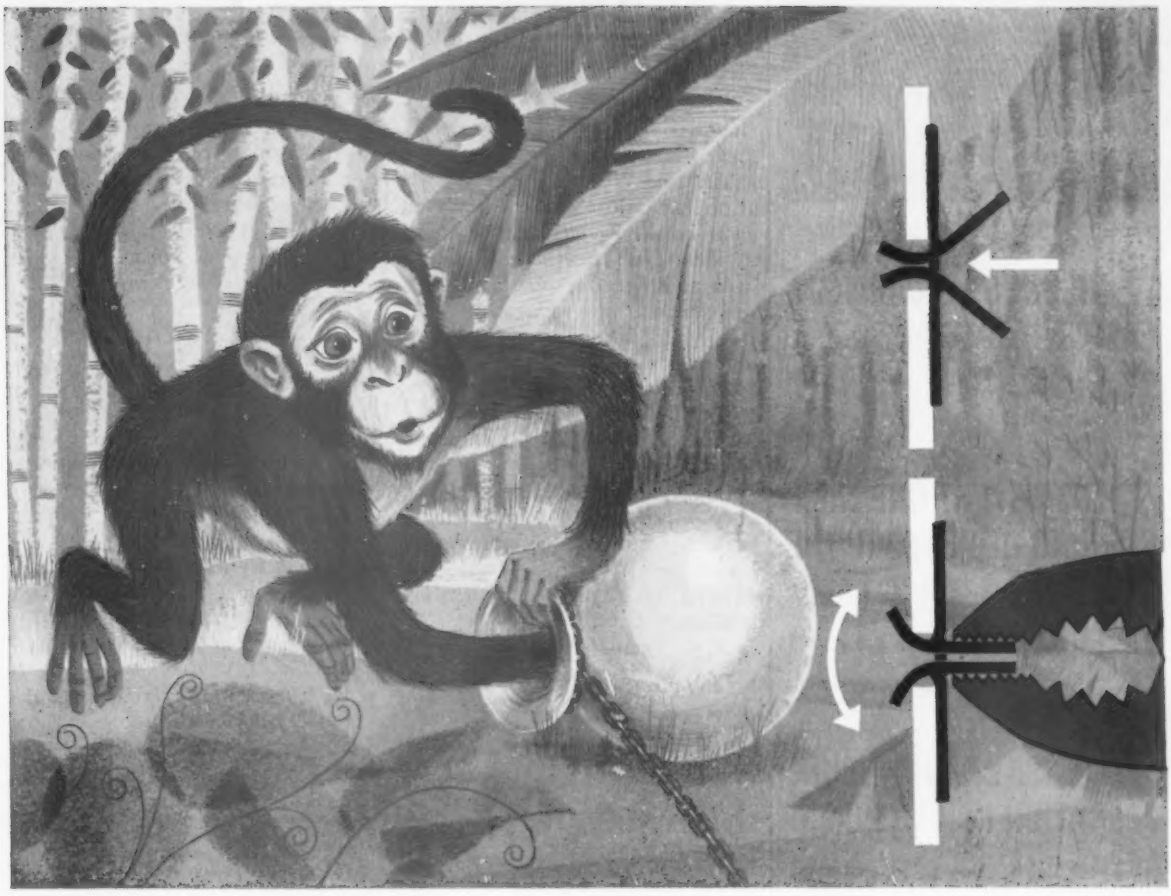
If drawings are made anywhere in your operation, you can use CRONAFLEX Drafting Film to great advantage. CRONAFLEX Drafting Film joins the widely acclaimed CRONAFLEX line of films: Direct Positive, Contact and Projection. You can go from original drawing to final reproduction with the same product line on the same strong base. For more information write: E. I. du Pont de Nemours & Co. (Inc.), Photo Products Department, Wilmington 98, Delaware. In Canada: Du Pont of Canada Limited, Toronto.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

**DuPont's trademark for its polyester photographic film base.*

For More Information Write No. 189 on Inquiry Card—Page 32



TRAPPED BY A GRIP THAT WON'T LET GO!

See how Tinnerman "pinch-grips" hold front-mounting attachments; no special equipment needed

Typical of Tinnerman *new approaches to old problems* are "pinch-grip" SPEED CLIPS—permitting front-of-panel applications in a second's time. SPEED CLIPS are simply inserted into mounting holes and a plier's pinch gives permanent retention.

SPEED CLIPS can increase production rates, eliminate rejects, cut assembly costs as much as 50%. Many different features may be incorporated in the SPEED CLIP design to fasten cables, wire harness, rubber feet, mouldings, and for scores of other assemblies.

You may have a fastening problem that can be solved—or a product which can be improved—by this SPEED CLIP principle. Your Tinnerman specialist (see the Yellow Pages) can furnish samples and help you in many ways. Or write:

TINNERMAN PRODUCTS, INC.
Dept. 12 • P.O. Box 6688 • Cleveland 1, Ohio

TINNERMAN
Speed Nuts®



FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S.A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano Bundy GmbH, Heidelberg.

For More Information Write No. 190 on Inquiry Card—Page 32

4 Hints on fluorescent starter selection

1 TO USE STANDARD 40W LAMPS IN COLD AREAS . . . use G-E FS-44 Thermal Switch Type Starters

2 TO PREVENT ONE LAMP BURNING OUT BEFORE THE OTHERS IN 2- OR 3- LAMP FIXTURES . . . use G-E FS-400 Watchdog* Starters

3 TO ASSURE NO-BLINK OPERATION IN HOT, HUMID AREAS . . . use G-E FS-4NA Automatic Reset Starters

4 TO GET 17% MORE LIGHT FROM THE SAME FIXTURES . . . use G-E FS-400 Starters with new G-E "Premium 3" Lamps

TO GET A COMPLETE LISTING OF HELPFUL HINTS . . . ask your General Electric distributor for your free "G-E Starter Selection Chart and Maintenance Guide for Fluorescent Lighting". And, if you have any question that's not answered, we'd like to hear it! General Electric Company, Wiring Device Department, Providence 7, Rhode Island.



*Registered Trade-mark of General Electric Company

GENERAL ELECTRIC

For More Information Write No. 191 in Inquiry Card—Page 32

Letters To The Editor

HELPING THE HOSPITALS

Dear Sir:

The Mid-West Hospital Association has asked me to speak on some hospital purchasing subjects at their next meeting.

In addition to the subject matter which I will discuss I would like your permission to reprint and pass out copies of the article, "Are You The Indispensable P.A.?" which appeared in the March 30 issue of PURCHASING Magazine.

It is indeed well written and very interesting, and will most certainly be an excellent "carry home piece" for the persons attending this purchasing workshop in Kansas City.

Frank W. Duran
Purchasing Agent
Hillcrest Medical Center
Tulsa, Oklahoma

• *We're glad we could help.*

SOME GREAT BOOKS

Dear Sir:

We would be very pleased if you would send a schedule of text books that may be known to you and which would be suitable for staff training and for reference in the purchasing field.

Tasman Pulp & Paper Co. Ltd.
Kawerau
Bay of Plenty, New Zealand

Dear Sir:

I am a student attending University High School. This semester I am taking a class called "Guidance," which helps us choose a future occupation.

I have read material on purchasing and becoming a head buyer. If you could send me some of your well-known information on purchasing it would be greatly appreciated.

Sandra Givens
Los Angeles, Calif.

• *A representative list of books which will benefit both the newcomer and the veteran follows:*

50 Years of Purchasing
By Paul V. Farrell, National Association of Purchasing Agents.

Industrial Purchasing
By J. H. Westing and I. V. Fine, John Wiley & Sons Inc.

Purchasing—Principles and Applications
By Stuart F. Heinritz, Prentice-Hall Inc.

The Art of Purchasing
By A. L. McMillan, Exposition Press.

The Theory Of Inventory Management
By Thomas M. Whitin, Princeton University Press.

Materials Buying Manual
By Harold A. Knight, Chilton Book Company.

Profiting From Industrial Standardization
By Benjamin Melnitsky, Chilton Book Company.

Procurement: Principles and Cases
By H. T. Lewis and W. B. England.

Purchase Law Manual
By A. W. Gray.

Management of Industrial Inventory
By Benjamin Melnitsky, Chilton Book Company.

Purchasing Handbook
George Aljian, editor, McGraw-Hill Book Company.

MORE ON BOOKSHELVES

Dear Sir:

I would like very much to obtain an editorial index covering PURCHASING *Magazine* for the year 1958. I have saved every issue as the information is very useful for a long time.

Your magazines from 1957 are also on my bookshelf but I have the editorial index for that year.

Galen E. Andrews
Barnes Drill Company
Rockford, Illinois

• *Readers interested in having this index may receive a free copy by sending requests to: Editor,* PURCHASING *Magazine, 205 East 42 Street, New York 17, N. Y.*

For More Information about ad on facing page Write No. 192 on Inquiry Card—pg. 32→

SAVING TIME ON THE LINE



Sems

PERMIT HOPPER-FED DRIVING OF LOCK WASHER AND SCREW!

There's an opportunity for real production-time savings in Sems. They're pre-assembled to eliminate handling of separate lock washers and screws on the assembly line . . . can be applied with a hopper-fed screwdriver for extra man-hour economies. Broad selection of types and sizes available. Inquire today.



36 Sources
conveniently located for fast service

AMERICAN SCREW COMPANY
Willimantic, Connecticut

ANCHOR PRODUCTS, INC.
Cleveland 5, Ohio
Waterbury 20, Connecticut

THE BLAKE & JOHNSON CO.
Waterville 14, Connecticut

BUTCHER & HART MFG. CO.
Altoona, Pennsylvania

CENTRAL SCREW COMPANY
Chicago 9, Illinois
Keene, New Hampshire
Frankfort, Kentucky

CONTINENTAL SCREW CO.
New Bedford, Massachusetts

EATON MANUFACTURING CO., RELIANCE DIVISION
Massillon, Ohio

ECONOMY SCREW CORP.
Chicago 14, Illinois

ELCO TOOL & SCREW CORP.
Rockford, Illinois

FEDERAL SCREW WORKS
Detroit 10, Michigan

GREAT LAKES SCREW CORP.
Chicago 27, Illinois

H. M. HARPER CO.
Morton Grove, Illinois

HARVEY HUBBELL, INC.
Bridgeport 2, Connecticut

INDIANA METAL PRODUCTS DIVISION, TEXTRON IND., INC.
Rochester, Indiana

KENTUCKY SCREW CO.
Louisville, Kentucky

LAKE ERIE SCREW CORP.
Cleveland 7, Ohio

THE LAMSON & SESSIONS CO.
Cleveland 9, Ohio

MIDLAND SCREW CORP.
Chicago 32, Illinois

NATIONAL LOCK COMPANY
Rockford, Illinois

THE NATIONAL SCREW & MFG. CO.
Cleveland 4, Ohio
Los Angeles 22, California

PARKER-KALON DIVISION, GENERAL AMERICAN TRANSPORTATION CORP.
Clifton, New Jersey

PHEOLL MANUFACTURING CO.
Chicago 50, Illinois

PROGRESSIVE MFG. CO., DIV. OF TORRINGTON CO.
Torrington, Connecticut

REPUBLIC STEEL CORP. BOLT & NUT DIVISION
Cleveland 13, Ohio

RING SCREW WORKS
Van Dyke, Michigan

ROCKFORD SCREW PRODUCTS CO.
Rockford, Illinois

RUSSELL, BURDSALL & WARD BOLT & NUT CO.
Port Chester, New York
Los Angeles 33, California
Rock Falls, Illinois

SCOVILL MANUFACTURING CO. WATERVILLE DIVISION
Waterville 48, Connecticut

SCREW & BOLT CORP. OF AMERICA
Pittsburgh 30, Pennsylvania

SEMS DIVISION, TEXTRON INDUSTRIES, INC.
Rockford, Illinois

SHAKEPROOF DIVISION, ILLINOIS TOOL WORKS
Elgin, Illinois

SOUTHINGTON HARDWARE DIV. SCREW & BOLT CORP. OF AMERICA
Southington, Connecticut

THOMPSON-BREMER & CO.
Chicago 22, Illinois

TRIPLEX SCREW CO.
Cleveland 9, Ohio

UNITED SCREW & BOLT CORP.
Chicago 8, Illinois

WALES-BEECH CORP.
Rockford, Illinois

●

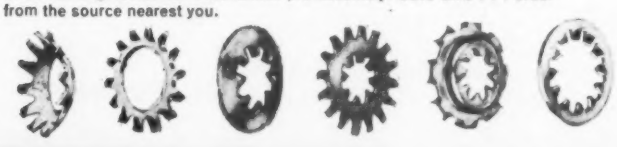
For information on SEMS sources in Canada contact:

CANADA ILLINOIS TOOLS LTD. SHAKEPROOF FASTEX DIVISION
Don Mills, Ontario, Canada

FOR GREATER PRODUCT DEPENDABILITY

Specify SHAKEPROOF® LOCK WASHERS on Sems

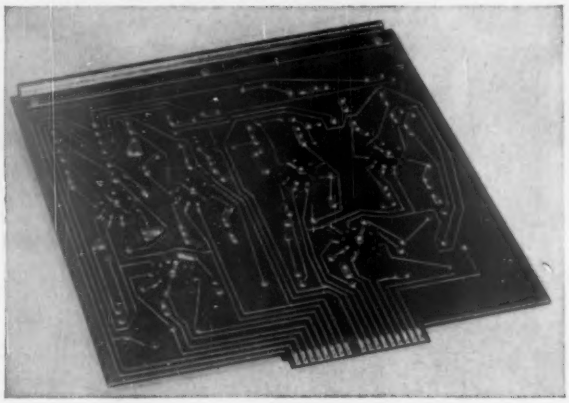
Each Shakeproof Lock Washer is especially designed to insure a firm grip in a specific type of application. They come in a wide variety of styles and sizes—all engineered for mechanical pre-assembly. Save time . . . order from the source nearest you.



Sems
pre-assembled screw and lock washer
SEMS is a development of Illinois Tool Works, Chicago

iTW

CDF PLASTICS AND FIBRE



Heart of the best printed circuits—

CDF Di-Clad® LAMINATES

Printed-circuit dependability begins at the base, and that's where CDF excels. Only CDF offers the combination of Teflon* resin and glass fabric cloth for use under sustained temperatures of 180°C. In addition, CDF offers a full range of Di-Clad laminates to meet every known demand of printed circuitry. High foil-bond strengths withstand soldering heats, reduce assembly rejects. Full line of Di-Clad grades — glass fabric and paper-base — with Teflon*, epoxy, and phenolic resins. Assembly costs go down when the job is done on CDF Di-Clads! Write for CDF Di-Clad Folder DC-58.

*duPont trademark for its tetrafluoroethylene resin

CDF PRODUCTS OF TEFLON

CDF produces an unequalled range of electromechanical parts of Teflon* — such as small- and large-diameter thin-wall tubing, glass-fabric laminates, flexible insulating tapes, sheets, rods, tubes, and finished parts. Now also available: cementable Teflon in supported and unsupported forms; can be cemented to itself and to most other materials with commercial adhesives. If you have a potential use for a product made from unsupported or reinforced Teflon — from tapes to high-heat-resistant printed-circuit laminates — your CDF sales engineer is the man to call. Meanwhile, write for the new CDF Teflon Folders.

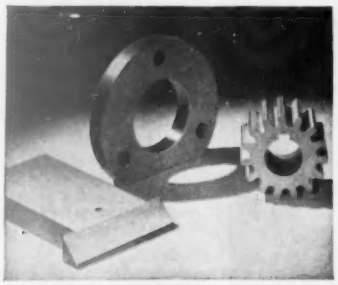
*duPont trademark for its tetrafluoroethylene resin



CDF HIGH-HEAT ELECTRICAL TAPES

Flexible insulating tapes for hand or automatic winding, made of glass-supported silicone rubber, silicone varnish, Micabond, with and without backings; and unsupported and glass-supported Teflon*. Color identification — CDF tapes of Teflon are made in the standard identifying colors. Call your CDF sales engineer, or write for test samples.

*duPont trademark for its tetrafluoroethylene resin



DIAMOND VULCANIZED® FIBRE

keeps costs down

Known for over sixty years as the standard of quality in fibre, Diamond® Vulcanized Fibre is made in many grades (bone, fish-paper, trunk, commercial, built-up) and is available in sheets, rods, tubes, strips, rolls, fabricated parts, and formed specialties. Write for Catalog DVF-58.

LOW-COST VULCOID is Resin-impregnated Vulcanized Fibre. Vulcoid (made only by CDF) is an intermediate insulation material. It combines the desirable arc-resistance and mechanical properties of vulcanized fibre with many of the good qualities of a phenolic laminate. UL-approved as Class A insulation in electrical equipment. Bearing applications requiring high precision have been successful with Vulcoid. Write for Bulletin V-58.



CDF CELORON® MOLDED PRODUCTS

Celoron is a molded-macerated and/or combination laminated base bonded with phenolic resins. High strength, long life, and low cost are the characteristics of molded electrical or mechanical parts made from CDF Celoron®. Its good electrical properties make Celoron an ideal molded insulator, while its high mechanical strength makes it an excellent material for gears, couplings, intricate loom parts, etc. Write for CDF Catalog C-58, or contact your nearest CDF sales engineer.

PURCHASING NEWS

CDF DILECTO® LAMINATED PLASTICS

for electrical and mechanical applications



DILECTO®, made in scores of grades, means high-quality laminated plastics made for rigorous duty in electrical, electronic, and mechanical equipment. Characteristics vary with the grade, so get the expert assistance of your CDF sales engineer.

RESINS AVAILABLE IN DILECTO:

Phenolic
Heat-resistant Phenolic
Silicone
Epoxy
Melamine
Polyester
Teflon*

BASES FOR DILECTO:

Glass Fabric
Nylon Fabric
Asbestos Fabric
Cotton Fabric
Glass Mat
Felted Asbestos
Non-woven Cotton Mat
Paper (either cellulose or asbestos)

CDF gives fast technical and delivery service on sheets, tubes, rods, or complete fabricated parts of Dilecto plastics. Write for Catalog D-55-C.

*duPont trademark for its tetrafluoroethylene resin

For a better motor or generator—

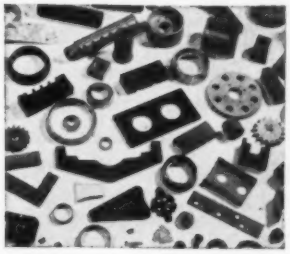


CDF MICABOND® INSULATING PARTS

CDF mica V-rings and slot liners insulate America's best-selling motors and generators. Finest-quality mica splittings insure highest heat-resistance and insulation under severe operating conditions.

Forms of Micabond® available: Sheets; Tubing; Tapes (with backings of cotton, silk, paper, woven glass, and Mylar† polyester film); Fabricated Parts of various shapes such as Mica segments. CDF supplies and fabricates Micabond to your strictest specifications — on time and at low cost. Call your CDF sales engineer or write for samples of Micabond and Catalog M-58.

†duPont trademark



PLASTICS FABRICATION BY CDF

SAVES YOU TIME, MONEY, WORRY

Let CDF's well-equipped machine shops assume the complete responsibility for delivery of your fabricated parts as specified and on time. No time is lost at CDF between raw-material production and final fabrication. When you let CDF do it for you, there's no problem of shortages, rejects, waste. Undivided responsibility pays off for you!

THERE'S A CDF SALES OFFICE NEAR YOU

BALTIMORE 14, MD. NOrthfield 5-0964
3451 Ellis Road
BIRMINGHAM 6, ALA. VErnon 3-5713
110 95th Street, N.
BOSTON GRanite 2-2150
1245 Hancock St., Quincy 69, Mass.
BUFFALO 3, N.Y. WAshington 3929
495 Ellicott Square Building
CHICAGO 11, ILL. DElaware 7-6266
1201 Palmolive Building
CLEVELAND 14, OHIO CHerry 1-5320
550 Leader Building
DAYTON 3, OHIO KEnmore 3114
39 N. Torrence St.
DENVER 2, COLO. AComa 2-2736
260 Denver Club Bldg.
DETROIT 35, MICH. BRoadway 3-0447
291 Officenter Bldg.
FT. WORTH 7, TEXAS FAnnin 3339
3414 Camp Bowie
GREENSBORO, N.C. BRoadway 4-0226
2103 Mimosa Drive
HARTFORD Hartford-JAckson 9-0397
15 Harding St., Wethersfield 9, Conn.
HOUSTON 27, TEXAS JAckson 3-9254
3302 Mercer Street
INDIANAPOLIS 5, IND. WAlnut 5-9803
709 East 38th St.
KANSAS CITY 11, MO. LOgan 1-6014
406 West 34th St.
LOS ANGELES 58, CALIF.
2400 Santa Fe Ave. Ludlow 2-6334
MILWAUKEE 19, WIS. LIncoln 1-7660
6108 W. Lincoln Ave.
MINNEAPOLIS 2, MINN. FEderal 3-6666 -3388
610 Plymout Bldg.
NEW YORK SCarsdale 5-1600
2 Overhill Rd., Scarsdale, N.Y.
OMAHA 3, NEBRASKA REgent 9110
116 North 40th St.
ORLANDO, FLA. CHerry 1-3774
2418 Rosedale St.
PHILADELPHIA Norristown-
Bridgeport, Pa. BRoadway 5-0800
PHOENIX, ARIZONA ALpine 8-7293
P. O. Box 1587
PITTSBURGH 21, PA. CHurchill 1-0969
309 Shields Bldg.
ST. LOUIS 10, MO. MIssion 5-2253
1246 Hampton Ave.
SPARTANBURG, S. C. SPartanburg 3-6397
834 Hayne Street
TULSA, OKLAHOMA LUther 7-6189
204 S. Cheyenne St.

Pacific Coast Representatives
MARWOOD LIMITED
SAN FRANCISCO 3, CALIF.
357 Ninth Street HEmlock 1-7893
SEATTLE 4, WASHINGTON
1714 First Ave. S. MAin 3-4747
PORTLAND 4, OREGON CApital 3-5123
209 S. W. First Ave.
LOS ANGELES 13, CALIF.
320 East 3rd Street MAdison 8-3241

In Canada
DIAMOND STATE FIBRE CO. OF
LOS ANGELES 11, CALIF.
46 Hollinger Rd., Toronto 16, Ontario,

EXPORT DEPARTMENT: BRIDGEPORT PENNSYLVANIA, U. S. A.

CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE Budd COMPANY • NEWARK 41, DELAWARE

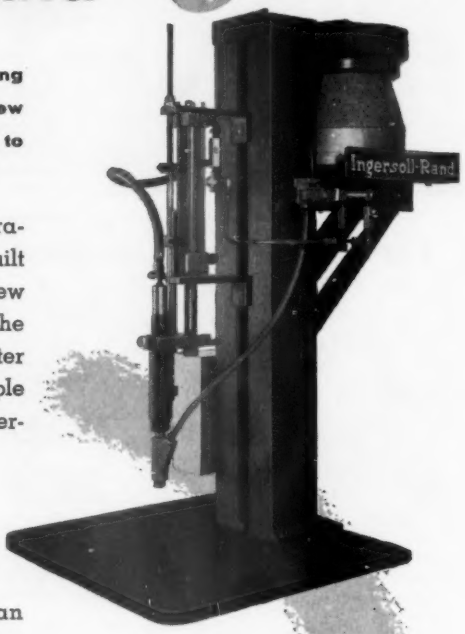
For More Information Write No. 193 on Inquiry Card—Page 32

for complete flexibility in rapid *automatic fastening*

the NEW r.a.f. screw driver by Ingersoll-Rand

You get complete flexibility by moving, adding or removing powerheads—by varying screw types or sizes—or by adjusting power ranges to meet different torque requirements.

Now you can automate your fastening operations without buying expensive, custom-built fastening equipment. With the versatile, new R.A.F. Screw Driver, you can run one job in the morning, and a completely different job after lunch. Changing the screw pattern is as simple as loosening and then tightening two powerhead bolts.



dividends on payroll dollars

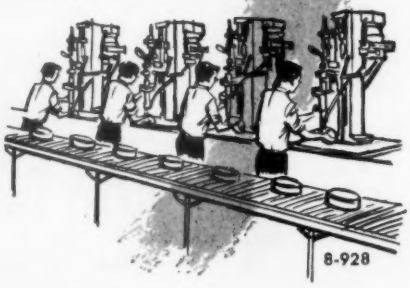
Using the new R.A.F. Screw Driver, one man can outperform a half dozen operators using conventional hand held screw drivers. As an example of savings possible with Rapid Automatic Fastening, multiply the yearly wage you pay one operator by the number of operators the R.A.F. Screw Driver replaces. This figure, minus the cost of the R.A.F. Screw Driver, represents your Dividend on Payroll Dollars for the first year alone.

For the full story on Dividend Dollars with Rapid Automatic Fastening, call your local Ingersoll-Rand office today, or write for Bulletin 5266.

✶ in small shops



✶ on assembly lines



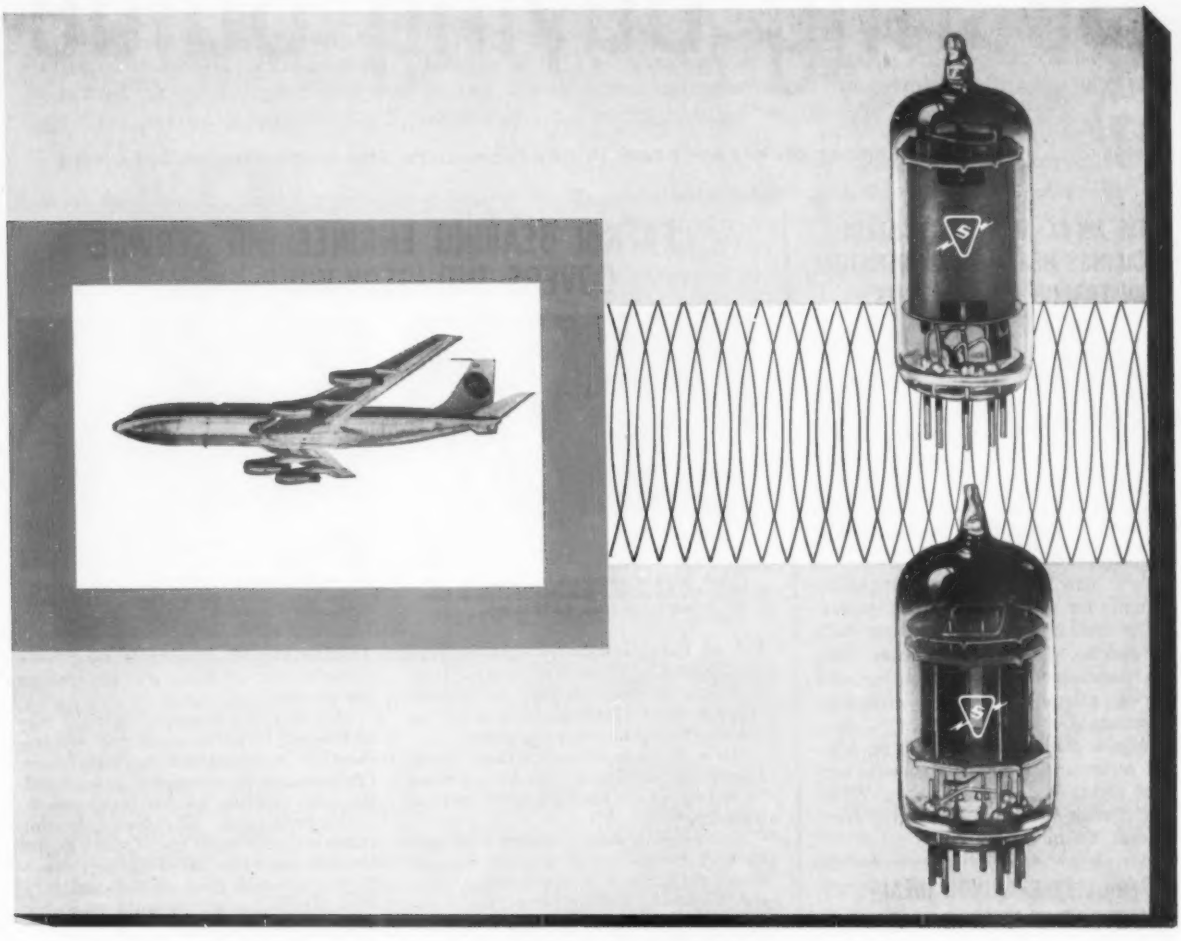
Ingersoll-Rand

11 Broadway New York 4, N.Y.

Tools plus AIRengineering increase output per man

For More Information Write No. 194 on Inquiry Card—Page 32

SYLVANIA GOLD BRAND TUBES...



and the new standard for the jet age

Today, every major airline uses Sylvania Gold Brand tubes. And in the new jet airliners, where the demand for top performance and reliability is more than ever a critical necessity, Sylvania Gold Brand types are becoming the leading choice. On Pan American's Boeing Jet 707 Airliners over 27 Sylvania types are in daily use.

Sylvania has developed a line of 47 Gold Brand tubes specifically designed for commercial and industrial applications. They are identified with a GB prefix and have become one of the fastest growing tube lines in the electronics industry. They are manufactured to special Gold Brand specifications that tailor the highest military standards to the individualized requirements of commercial and industrial equipment.

For premium quality and performance in any electronic application, use the tubes with the Gold Brand, from Sylvania.

SYLVANIA GENERAL SYSTEM

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

SYLVANIA ELECTRIC PRODUCTS INC.
1740 Broadway, New York 19, N. Y.
In Canada: Sylvania Electric (Canada) Ltd.
P. O. Box 1190, Station "O," Montreal 9

For More Information Write No. 195 on Inquiry Card—Page 32

Bearing Buying Guide

NO. 4 A REPORT ON FAFNIR BEARING DEVELOPMENTS AND DISTRIBUTION ACTIVITIES

NEW AW-AK AIRCRAFT CONTROL BEARINGS MEET HIGH-TEMPERATURE, LOW TORQUE REQUIREMENTS



Developed specifically for control systems of high speed aircraft Fafnir's new AW-AK 440C stainless steel ball bearings are heat stabilized and equipped with Teflon seals for operation at temperatures in the 550° range. Retainers insure low torque operation.

The new bearings are particularly suitable for use forward of the power-boost system where application calls for precise, sensitive, low torque bearing response. Bearing widths are held to close tolerances for ready mounting in standard brackets.

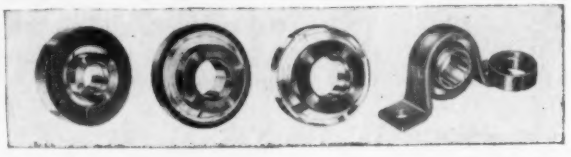
A new bulletin describing the AW-AK series and listing dimensions and load ratings is now available. Write The Fafnir Bearing Company, New Britain, Connecticut.

SUPER-QUIET BEARINGS IDEAL WHERE SILENT SERVICE IS DESIRED

Originally developed for use in home heating and cooling equipment, Fafnir Super-Quiet Ball Bearings and Ball Bearing Units also provide ideal answers for applications where unusually silent performance is desirable.

In office machines and similar equipment, for example, the specially-polished balls and races in these Fafnir bearings help cut objectionable noise.

The bearings are also available in special, current-conducting rubber rings, cartridges, or cushioned pillow blocks. Write for bulletin.



Fafnir Super-Quiet Ball Bearing (third from left) and current conducting rubber-cushioned RCSM and RCR Cartridges and RPB Pillow Block.

FAFNIR BEARING ENGINEERING SERVICE COVERS INDUSTRY-WIDE FRONT



Fafnir bearing engineers at work on customer problem. Engineering divisions handle requirements from all industry.



Metallurgist in Fafnir laboratory formulates heat-treating specifications in controlled atmosphere furnace.

Behind Fafnir's industry-wide diversity of line is a background of bearing engineering experience covering applications ranging from precision instruments to mammoth road-building equipment.

To meet needs on such a broad front, Fafnir engineering service is organized by divisions, each serving specific areas of industry.

Engineers in these divisions offer specialized knowledge of product requirements within their industry group. Textile machinery manufacturers, for example, can draw on the services of specialists in textile applications. Other divisions serve the aircraft, farm equipment, machine tool, air conditioning and the many other industries represented by Fafnir's diversified list of customers.

This combination of specialized know-how and all-industry diversity pays off time and again for manufacturers up against bearing problems. Ball bearing users can count not only on a seasoned approach to their particular requirements, but also benefit by Fafnir's experience in other, often wholly unrelated, fields.

Fafnir aircraft type ball bearings, for example, recently solved a bearing problem for a manufacturer of power tools. Another aircraft bearing is used by a manufacturer of automatic pin-spotting equipment.

Moreover, where special bearings may be needed, Fafnir research and development is well-qualified in man-power, facilities, and by experience to cope with the most exacting bearing requirements.

Comprehensive, all-industry bearing engineering service is one of many important customer benefits of Fafnir's nearly 50-year diversification of line and markets. Worth bearing in mind when you have bearing problems!

RADIOISOTOPES USED IN FAFNIR TESTING LABORATORY

Among the more recent evidences of Fafnir's leadership in bearing research and development is the establishment of a bearing testing program utilizing radioactive isotopes.

Set up to study wear in bearing components, the program took several months to put into operation. Company engineers worked with nuclear radiation consultants in establishing procedures and safeguards in compliance with AEC regulations. Test lab personnel were specially trained in the proper handling of radioisotopes and the delicate instruments for monitoring and controlling testing.

The program marks another step forward in Fafnir's policy of using the most advanced techniques in developing new and better bearings for industry.

FAFNIR
BALL BEARINGS
MOST COMPLETE LINE IN AMERICA

Branch Offices: Atlanta* • Baltimore • Boston (Cambridge)* Charlotte* • Chicago* • Cincinnati • Cleveland • Dallas* Denver* • Detroit* • Houston • Indianapolis • Kansas City* Los Angeles* • Memphis* • Milwaukee • Minneapolis* Moline • New Orleans (Metairie) • New York (Woodside)* Philadelphia* • Pittsburgh* • Portland, Ore.* • Rochester San Francisco (Millbrae)* • Seattle* *Includes warehouses

For More Information Write No. 196 on Inquiry Card—Page 32

Purchasing People In The News

Aluminum Company of America, Pittsburgh, Pa., has announced the appointment of three assistant general purchasing



G. O. Pratt



Roger C. Sharp



L. B. Neubert

agents; **L. B. Neubert, G. O. Pratt,** and **Roger C. Sharp.** All three appointees are members of the Purchasing Agents Association of Pittsburgh and National Association of Purchasing Agents.

Mr. Neubert joined the company in 1937 in the power division of its Alcoa, Tenn. works. He served as district purchasing agent at several of the company's locations. Following service as senior electrical engineering buyer in the Pittsburgh office, he was appointed senior construction engineering buyer in 1956. He is a graduate of the University of Tennessee. Mr. Pratt joined Alcoa's metallurgical department at the New Kensington, Pa. works in 1937. He was named Torrance, Calif., district purchasing agent in 1941. In 1945 he became raw material and chemical engineering buyer in the Pittsburgh office. Mr. Pratt is a graduate of Purdue University. Mr. Sharp, an alumnus of Pennsylvania State University, joined Alcoa as an electrical engineer at its Massena, N. Y., works in 1940. He entered the purchasing department in 1947 as an electrical buyer in Pittsburgh. In 1954, he was transferred to New Kensington where he was district purchasing agent, before being appointed senior electrical engineering buyer in Pittsburgh in 1956.

Harry W. Taylor Co., Detroit and Kalamazoo, Mich., has announced the appointment of **Norman C. Smith** as manager of purchases for the Detroit office. His responsibility will include warehouse operation in addition to purchasing and inventory control. **Hugh MacDonnell** will continue as purchasing agent and **Dale Decker** will become warehouse superintendent.

Appointment of William C. Cawthon as general purchasing agent for **Chrysler Corporation, Detroit, Mich.** has been an-



William C. Cawthon

nounced. In his new position, Mr. Cawthon will be in charge of all corporate buying operations and the company's relations with its 12,000 supplier concerns. Administrative services for the purchasing department will be the responsibility of **E. Lloyd,** director of purchasing administration. Prior to his new assignment, Mr. Cawthon had been plant manager of the Plymouth Detroit Assembly Plant since February, 1959. He joined the company in 1947 as a graduate student at the Chrysler Institute of Engineering. He was named general superintendent of manufacturing at the Dodge Assembly Plant in 1956. In 1957 he was named general works manager at Dodge. In 1958 he was appointed plant manager at Dodge.

He is a graduate of Cornell University, the University of Texas and the Chrysler Institute of Engineering with degrees in mechanical, electrical and automotive engineering.

Worthington Corporation, Harrison, N. J., has announced the appointment of **George H. Salesky, Jr.,** as manager of purchasing for the Air Conditioning and Refrigeration Division. Mr. Salesky, who has been with the company for 19 years, has served as production supervisor for packaged and industrial air conditioners at the Holyoke, Mass. plant. He has also been manager of production at the Decatur, Ala. works. Since 1957, he has been staff assistant to the manager of manufacturing of the AC&R division, with responsibility for inventory and production control.

The Lamson Corporation, Syracuse, N. Y., has announced the appointment of **Charles S. Estabrook, Jr.,** as manager of pur-



Charles S. Estabrook, Jr.

chasing. **William Carr** has been namd assistant to Mr. Estabrook. Prior to joining the company, Mr. Estabrook was purchasing agent with the Easy Laundry Appliance Division of the Murray Corporation in Syracuse. He is a graduate of Hamilton College in Clinton, N. Y.



Cut filing costs with files that increase filing skill

Time and labor—not the file—are the largest part of filing costs. But the file directly affects the time it takes to finish the job. The file is a hand tool—in effect, an extension of the man. If it reduces his skill, the work suffers and costs go up. If the file matches or increases his skill, he becomes more productive and costs go down. That's why more users choose *Nicholson, Black Diamond and X.F. (Extra Fine) Swiss Pattern files than any other. That's why file buyers and users* prefer *these brands over any others.*  *X.F. Swiss Pattern Half Round file, one of more than 6000 Nicholson-made files that can cut your filing costs. We design our files to bring out the man's highest skill. He does his best work when he uses them. They are the most economical files you can buy. Your Industrial Distributor has a full selection. Call him for the Nicholson or Black Diamond file for your purpose.*

NICHOLSON

NICHOLSON FILE COMPANY, PROVIDENCE 1, RHODE ISLAND

Files and Rotary Burs — Hacksaw and Bandsaw Blades
Ground Flat Stock — Industrial Hammers

* Industrial Distributors provide the finest goods and services in the least possible time. Our products are sold exclusively through them.

For More Information Write No. 197 on Inquiry Card—Page 32



Alan Wood Super Diamond floor plate ...is easy to bend

The arrangement of the exclusive A. W. Super Diamond pattern lets you bend this flooring at any place on the plate. Form this heavy duty floor plate to fit steps, ramps and walkways . . . it bends readily.

Fabrication is easy . . . you can shear it, weld it and match it wherever necessary. A. W. Super Diamond provides a safe, non-skid footing . . . won't chip, splinter or crack. Save on cleaning costs, too . . . A. W. Super Diamond is easily swept, mopped or hosed from any direction. It drains freely . . . no pockets to hold dirt.

For easy fabrication and installation . . . for safety . . . for long wear . . . specify A. W. Super Diamond. Write for Bulletin SD-N5.

ALAN WOOD STEEL COMPANY
CONSHOHOCKEN, PA.

DISTRICT OFFICES: Philadelphia • New York • Los Angeles • Boston • REPRESENTATIVES: Atlanta • Buffalo Cincinnati • Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul • San Francisco • Seattle Montreal, Toronto and Vancouver, Canada—A. C. Leslie & Co., Ltd.

For More Information Write No. 198 on Inquiry Card—Page 32

SPEED-BAND®
the newest concept in band saw blades—made from L-100-M, a double carbide alloy developed especially for band saws. Its hot hardness and abrasion resistance effect extraordinary results.



Available only from Capewell Distributors, of course

INDUSTRIAL DISTRIBUTORS SERVING INDUSTRY ECONOMICALLY
THE RIGHT BAND OF PRODUCTION

CAPEWELL

THE CAPEWELL MFG. CO.
HARTFORD 2, CONN.

For More Information Write No. 199 on Inquiry Card—Page 32

FOB-"filosofy of buying"

FELLOW in a red suit came into the office last week, put his big black boots up on the desk, parted his whiskers, shifted what looked suspiciously like a betel nut to one side of his mouth, and said:

"Getting any grass roots sentiment to denounce Christmas gifts to P.A.'s again this year?"

"Wait a minute," we said. "Are you the guy who used one of our stamped, self-addressed envelopes to mail us a catalogue of gift selections from The Wisconsin Cheeseman and not only misappropriated the stamp but made us pay 4¢ postage due?"

"Nope," said Red Suit, "but the way you've been yipping and yapping about these little manifestations of brotherly love—say did you see that smoked pheasant assortment of the Cheeseman's—I wouldn't be a bit surprised if the great American public didn't flood you with mail, and make you pay for it."

We allowed as how we weren't against brotherhood, except when it's listed as a cost of doing business; or against Santa Claus, except when he tries to sneak in backdoors instead of letting the whole world see him; or against Christmas, except when it's turned into a gigantic freeload that only costs everybody more in the end. And we're not against people either, we told him, except those who try to hang P.A.'s on the gift-getting rap when their own loot from suppliers is considerable.

"All well and good, sonny," said old Black Boots, "but your college course in ethics or whatever it is that makes you think that way just didn't prepare you for the realities of business life. But let's not get off into any aimless, fruitless discussions on philosophy and all that jazz, Buster. I want to tell you about a couple of snappy items now available to thoughtful suppliers that will help them spread around the true spirit of Christmas."

He moved his boots off the desk, knocking over an ash-tray we had received at a press party, and continued:

"Now Tiffany's has something for the customer who likes golf—a 14-karat gold putter, at a bargain price of $1,475, including that accursed 10% Federal tax. And if those bureaucrats spend us into a depression, a man with one of those can always melt it down and sell it to the government at 35 bucks an ounce. Then there's a live Mexican burro loaded with two baskets of food delicacies that goes for only $250. A man would be a jackass to refuse one of those."

"Interesting", we said, refusing a cigar. "Let those who want to give those things give them. And let the recipients let their consciences be their guides. We don't want to get into any public hassle with the Gold Putter Manufacturers' Protective Association, or the National Institute of Loaded Donkeys or anyone else in the business of selling business gifts. We'll settle on a live and let live policy, if you'll let us read you an exchange of correspondence that took place one Christmas. Then you, your supplier friends, P.A.'s, and all others mixed up in this thing can reach their own conclusions."

"Shoot," said old White Whiskers.

These are the letters—the first to A. G. Spieker, head of a firm in Toledo, O., the second from him to supplier:

Dear Mr Spieker:

Every year, many companies go through the problem of how to remember and thank their customers for patronage during the year. As a result, a deluge of small gifts floats around business offices.

We've wrestled with the same problem, but we're not happy with that solution. We think our customers prefer us to do business on the basis of the product and service rendered, without resorting to gifts to stay in favor.

Still we want to express our

genuine appreciation. So this year, on behalf of our customers we have 'adopted', through the Save the Children Federation, two little girls who fled from behind the Iron Curtain only to encounter bitter poverty in Free Europe. Gabriella, six-years-old, gets her one meal a day in school and cannot comb her hair because her parents do not own a comb. Erika, five-years-old, is not really free, because she has no coat or shoes for the winter. These children will receive not only food, clothes, and medicine, but also faith and hope.

So at this time of year, when a Birth is foremost in the hearts of so many people, our gift to you is a little bit of life itself. A small life, to be sure, but we hope the idea pleases you.

Sincere best wishes,
The Hausman Steel Co.
James S. Hausman

Dear Jim:

I want you to know that your letter of December 19 made all the rest of the morning's mail and all the gift wrapped packages and Christmas cards on my desk seem somehow unimportant.

I can think of no Christmas remembrance I have received or may receive quite equal to the one you have given me—the thought that something physical which may have been headed for my desk has been transformed into something far more valuable on behalf of two children who are the responsibility of us all.

May the warmth of the season be yours, and may you gather as much satisfaction from the plan you have originated as do we whom it has touched.

Yours sincerely,
The Henry J. Spieker Co.
A. G. Spieker

'Sa-a-y", said Red Suit, "maybe you've got something there. I'm going to let my brother know about this. What's the address of that Save the Children outfit?"

"Boston Post Road, Norwalk, Connecticut," we answered. "But who's your brother?"

"Santa Claus, you clown", he said, grabbing a handful of candy samples we had received in the mail that morning and walking briskly down the hall.

WIRE CLOTH



for

FILTERING

SIZING

STRAINING

TESTING

In all metals, in all weaves ... woven to the highest accuracy standard in the industry. You just can't buy a better wire cloth than "NEWARK." Hundreds of meshes, weaves and metals to fit *your* specific need. Years of processing experience to help you pick the right wire cloth for *your* application. Write for Bulletin FC or write us about your problem. Fast deliveries, best cloth, lowest cost when you call on NEWARK.

NEWARK for ACCURACY

Newark Wire Cloth COMPANY

351 VERONA AVENUE • NEWARK 4, N. J.

For More Information Write No. 200 on Inquiry Card—Page 32

General Electric announces the new Adjust-O-Breaker toolholder!

Carboloy® toolholder with adjustable chipbreaker lets you adjust from any angle . . . offers any desired adjustment within its range* . . . features "floating" indexable chipbreaker with absolute repeatability.

MORE jobs with *LESS* tooling—that's what you get with this new Carboloy® Adjust-O-Breaker toolholder! No need to have a separate chipbreaker for every cutting job. No need to restrict yourself to toolholders with only two or three chipbreaker settings. Now you can have this versatile new Carboloy toolholder . . . and *adjust it for any chipbreaker setting within its range.**

Available right now from stock in 5 styles, negative rake, for left- and right-hand machining, the Adjust-O-Breaker truly brings new meaning to disposable tooling.

So, to get cutting tool versatility that lets you handle *more* jobs with *less* tooling, check into the complete Carboloy line—Lift-O-Matic (positive rake, negative rake, and tracer), heavy-duty, and the new Adjust-O-Breaker toolholder. The complete line of Carboloy inserts, insert seats, convertible seats, and brazed tooling is the *broadest* in the industry . . . designed to meet *every* tooling need to give you BETTER PROFITS THROUGH BETTER TOOLING.

See your Authorized Carboloy Distributor now. He's listed in the Yellow Pages. *Metallurgical Products Department of General Electric Company, 11143 E. 8 Mile Street, Detroit 32, Michigan.*

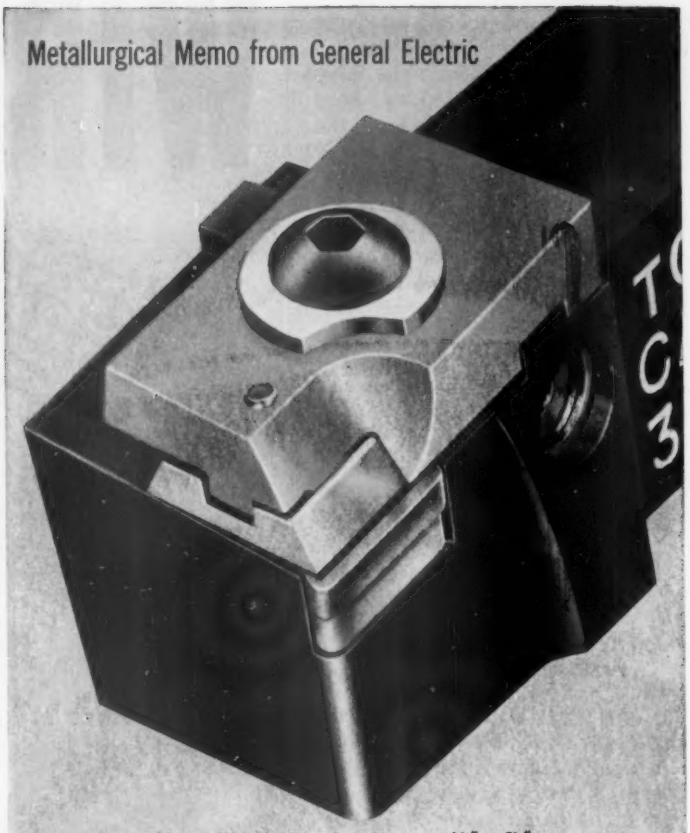
CARBOLOY®
CEMENTED CARBIDES

METALLURGICAL PRODUCTS DEPARTMENT

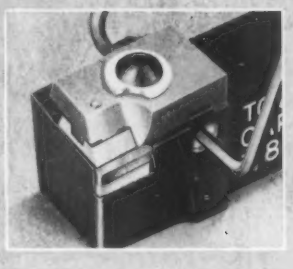
GENERAL ELECTRIC

CARBOLOY® CEMENTED CARBIDES
MAN-MADE DIAMONDS • MAGNETIC MATERIALS
THERMISTORS • THYRITE® • VACUUM-MELTED ALLOYS

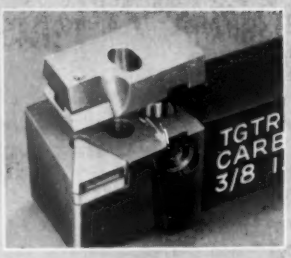
Metallurgical Memo from General Electric



*Sizes 16V and 85V: adjustable range 1/16" to 7/32"
Size 20V: adjustable range 1/16" to 1 1/32"



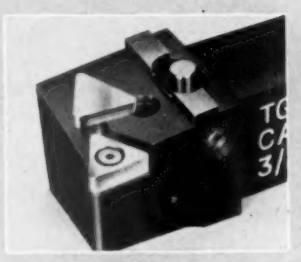
1. Chipbreaker setting adjusts to any width within range.* Set screw with two open ends provides access from either side. No springs to adjust.



2. Design permits absolute repeatability of settings. Floating chipbreaker is indexable. Can't drop out when clamp is loosened.



3. Clamp screw is accessible from top or bottom; allows easy indexing or replacement even when toolholder is vertical or upside down.

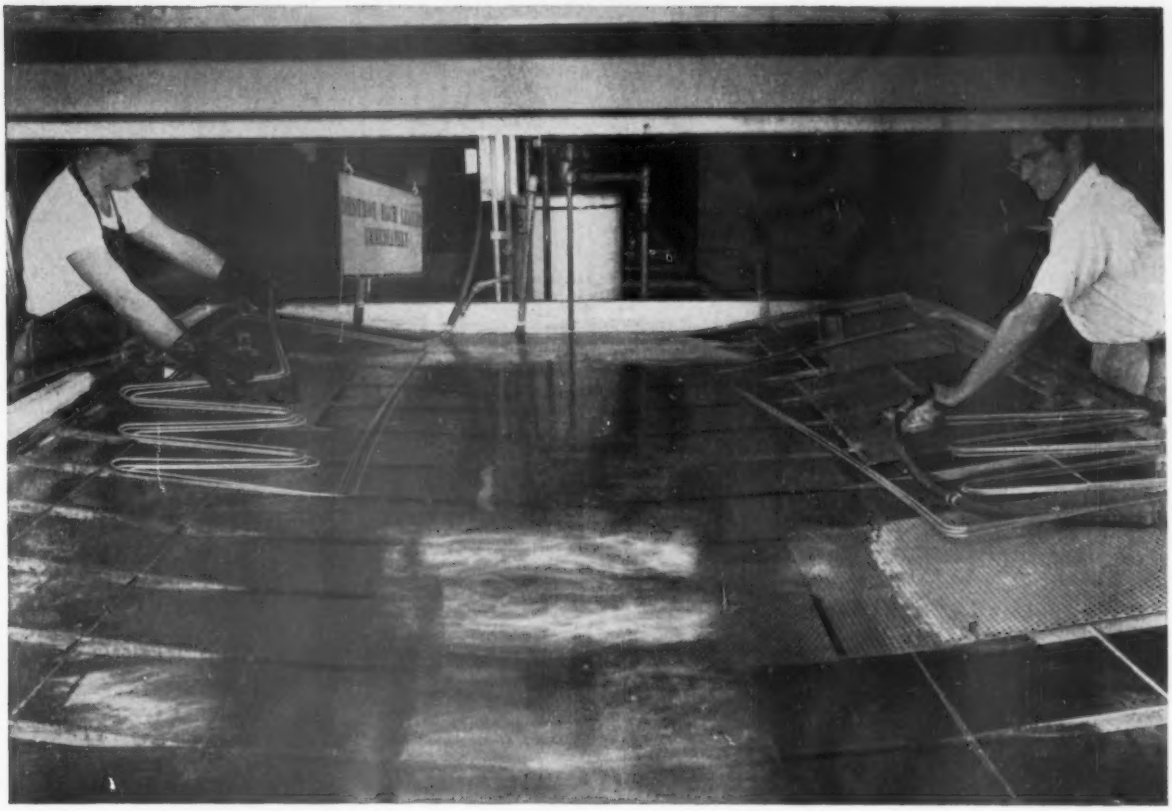


4. Standard disposable inserts, Carboloy insert seats and convertible seat are used with toolholder. Insert seats are indexable and self-aligning.

For More Information Write No. 201 on Inquiry Card—Page 32

THE PEOPLE WHO KNOW REFRIGERATION BEST

DEPEND ON THE PEOPLE WHO KNOW TUBING BEST!



THE CLEANEST TUBING YOU CAN BUY...
UNDER PRESSURE EVERY INCH OF THE WAY!

Every inch of GM Steel Tubing is pressure-tested and cleaned. Solvent is introduced under pressure to all bulk coils, checking structural strength and assuring an I.D. free of internal residue. Then after your specifications take shape—as in the serpentines above—they are again tested under pressure to assure a clean, leak-proof tubing that will stand up under the most rigid conditions for the life of your product. Call a GM Steel Tubing Sales Engineer today. Put some of this top-quality tubing on test now. See how you can save time and money with the cleanest tubing you can buy. *Rochester Products Division of General Motors, Rochester, New York.*

GM STEEL TUBING
BY ROCHESTER PRODUCTS

RP

AMERICA'S LARGEST MANUFACTURER OF REFRIGERATION TUBING

For More Information Write No. 202 on Inquiry Card—Page 32



NOW...

your UDYLITE nickel brighteners come in this new RIP-OPEN PACKAGE for greater speed and SAFETY!



This new Udylite carton provides you with a handy replaceable lid that fits snugly back on the box to keep out dirt and protect the remaining bottles.

This new Rip-Open packaging, just introduced by Udylite, is typical of the attention we feel is due small details. Speedy and easy is the opening job when, with a roundhouse *rip* of the tear-off strip, your carton of Udylite brightener containers is open . . . neatly and evenly.

Here is one more example of why it pays to deal with Udylite—where you can be sure of getting first rate plating supplies of a quality and price that you know you can depend upon. And always at Udylite you find the respect for fine points of performance that makes this the finest plating supply service. If Udylite isn't already your source, investigate now the advantages of dealing with

the udylite corporation

detroit 11, michigan

world's largest plating supplier

For More Information Write No. 203 on Inquiry Card—Page 32

Highlights of This Issue

The Search for Value Starts Early

At first glance, it seems purchasing's part in research and development would be relatively unimportant. After all, the R & D boys are highly technical people 'way out on a cloud and you'd inhibit them by having practical purchasing people poking around in their affairs. But there is a lot a good analyst or buyer can do to help R & D and the rest of the company in getting a new product off the ground. A buyer for a large chemical company lists several important contributions purchasing can make.

See page 80.

More Help on Make-or-Buy

Figures turned up in make-or-buy studies are often deceptive because they're based on incomplete information. The more data you can develop on a complex make-or-buy problem, the more likely you are to arrive at a correct decision. One of the newer approaches in developing such information is Linear Programming. The latest in our series on this new cost-reduction technique deals with its application to make-or-buy situations.

See page 69.

Beware the Ides of December!

Now that the national conscience has had a bit of shaking up by the TV scandals, it doesn't seem like beating a dead horse to discuss once again the problem of Christmas gifts for businessmen. Whether it does or not doesn't seem to bother the old Filosofer of F.O.B. He has his say about the subject in this issue and hopes a few people snap back at him some time after the middle of this month when all gifts have been either returned or stashed away at home.

See page 60.

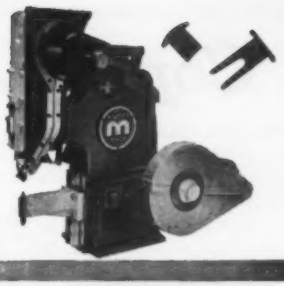
The Business Outlook

The steelworkers are back, but how much steel they'll get out in the next few weeks and how much good it will do the industry's customers are still very much up in the air. For an informed, up-to-the-minute analysis of what this and other developments are doing to the economy, be sure to see The Pulse of Business.

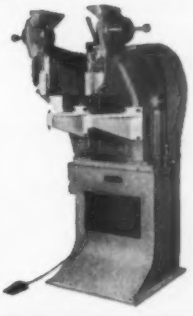
See page 7.

Coming In Future Issues

Cutting Transportation Costs—What Is A P.A.?—Measuring Your Department's Output and Performance



CUT RIVET ASSEMBLY COSTS



with Milford's Complete Line of AUTOMATIC RIVETERS



Can be adapted to solve nearly every fastening and assembly problem. For the answers to assembly problems... *get in touch with Milford first!*

THE MILFORD RIVET & MACHINE CO.

MILFORD, CONNECTICUT • HATBORO, PENNA.
ELYRIA, OHIO • AURORA, ILL. • NORWALK, CALIF.

For More Information Write No. 204 on Inquiry Card—Page 32

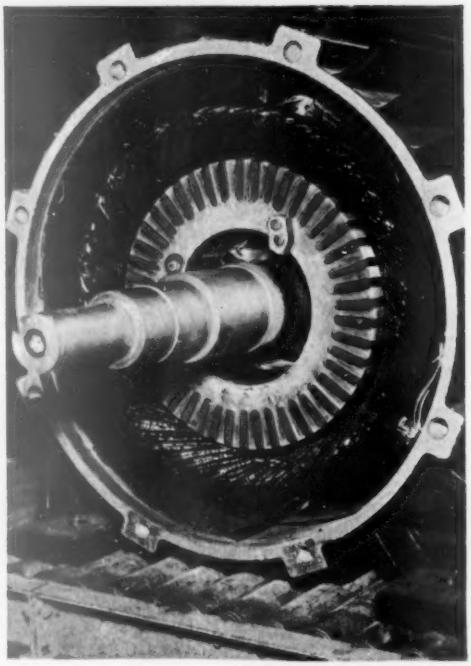
Copper Alloy Bulletin

BRIDGEPORT BRASS COMPANY

Bridgeport "CONTACT BRONZE"

Cuts Costs of Electrical Spring Contacts by 25%

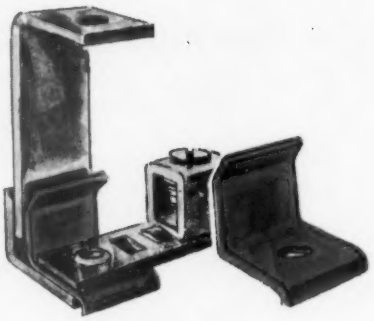
This outstanding Bridgeport alloy offers many of the superior mechanical qualities of phosphor bronze at considerably less cost... with a superior electrical conductivity rated at 22% IACS at 68° soft. Designed to meet the exacting standards of the electronics industry, Bridgeport "Contact Bronze" (Alloy 92) maintains spring properties even after difficult forming operations. Add corrosion resistance and "Contact Bronze" is a guarantee of efficient and reliable performance throughout your product's service life. Here are a few examples:



ELECTRIC MOTORS

The 100-hp 4-pole motors driving extruder-type machines in a dog-food plant were causing frequent production breakdowns. The material processed was so highly viscous that the motors were stalling, jogging and burning out. To meet the high torque, high slip necessary to minimize stalls and also to provide the high thermal capacity required, Allis-Chalmers Company designed a special motor rotor utilizing Bridgeport "Contact Bronze" in place of copper. Burnouts from overload were eliminated and the performance of the "Contact Bronze" motor was so excellent that Allis-Chalmers received an order for another sixteen of the same type.

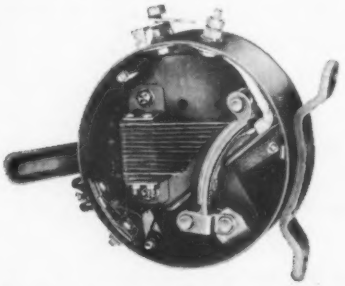
PRESSURE CLIPS



American Electric Switch Division, Clark Controller Company, found that "Contact Bronze" fitted their needs for a lower cost alloy for pressure clips. Its electrical conductivity, corrosion resistance, spring and formability properties were more than comparable with other alloys... at 25% less cost.

TRAILER TRUCK BRAKING SYSTEM

Warner Electric Brake & Clutch Company manufactures an ingenious electric brake system for heavy-duty trailer trucks. Through a graduated series of Bridgeport "Contact Bronze" leaves, it allows the driver to adjust torque instantly and smoothly to suit load and road conditions. The conductivity and performance-proved spring properties of "Contact Bronze" provide added safety and long-haul reliability.



✓Check the Savings
INVESTIGATE
"CONTACT BRONZE"

Electronic and mechanical devices, switch gears, circuit breakers, contacts, terminals are just a few of the applications. There are thousands of others. Call your nearest Bridgeport Sales Office or write Dept. 3713 for full details of Bridgeport Contact Bronze. Bridgeport Brass Company, Bridgeport 2, Conn.

For More Information Write No. 205 on Inquiry Card—Page 32

How Deep Is Your Bench?

PURCHASING people who belong to the Hot Stove circuit can see an interesting parallel between their profession and the new Continental Baseball League. They both face one big problem: Where are we going to get the right caliber players to get the recognition we want? Both are trying to meet new demands created by growth and expansion of various segments of the country. But will they be able to find the people who will do credit to big-league baseball or big-league buying?

One could almost say flatly right now that even the great Branch Rickey won't be able to muster much more than a team of first-rate bushers much less a whole league of big-leaguers. But that's his problem and we wish him well.

Purchasing is in a little better position. For several years now there has been a steady trend upward in both quantity and quality in the people who want to make buying a career. Concurrently with this influx of better educated, more technically trained personnel has come a movement toward relieving buyers of clerical detail. In department after department throughout industry you can hear of programs designed to give buyers more of a chance to become true negotiators and free them of paper shuffling. The new interest in purchasing training is also part of the attempt to reach this goal.

The problem is far from solved, however. The director of purchases of a growing company complained to me the other day that he was having trouble deciding how to staff the purchasing departments being established at branch plants. Should he take his number one man among his buyers and thereby weaken his own operation? Or should he take number two or number three and run the risk of having purchasing make a poor showing when it should start off with a bang? Or should he bypass his own buyers and go outside? "It's tough," he remarked. "There are just not enough high-quality people with purchasing experience available for the jobs that are opening up. I just wish I could find broader, better equipped people."

If your company is typical you'll be facing the same problem soon—if not in branch plants, at least in your own expanding department. Now is the time to start doing something about it.

The first step is to ask yourself honestly if you have selected and trained the people behind you to take your job. Do you try to bring your buyers along by making them part of your purchasing management? If they show management potential do you try to develop it or do you try to hide it under a basket of detail or indifference? If for none other than selfish reasons, it's bad to break the spirit of the man behind you by cutting him out of planning, decision-making and other areas in which he might make a contribution. The payoff comes when top management calls on you to fill new jobs.

To get back to baseball, at least metaphorically—how deep is your bench?

Paul V. Farrell

PURCHASING MAGAZINE
DECEMBER 7, 1959

Steel and aluminum users report increased values from Ryerson

These case histories—selected at random from our files, provide additional evidence that you consistently get increased value for your purchasing dollar from Ryerson. Individual points of difference between Ryerson and other sources may not by themselves seem overwhelming—but in total they add up to an important difference in dependability, experience and capacity to serve.

A world famous manufacturer formerly tested all steel purchased from steel-service centers for critical ordnance work. But, often, test costs on small lots of steel were greater than material costs. So the company decided to concentrate its purchases with sources proved completely reliable—and discontinue its own testing. Experience showed that the required certifications of quality were always absolutely dependable in the case of only three steel suppliers—among them Ryerson where quality has been a watchword since 1842.

Milling operation eliminated. A structural fabricator followed the usual practice of milling the ends of beams to be used as column bases until he discovered the accuracy and squareness of Ryerson friction sawing. Now he has eliminated the milling operation because, at no extra cost, Ryerson can guarantee friction saw accuracy of only ± 1/16″ for beams up to 6″ and ± ⅛″ for sections over 6″—squareness tolerances of .010″ per inch of section.

Better product appearance and a worthwhile saving in material cost resulted when a Ryerson man recommended that a producer of portable coolers switch from one aluminum alloy (3003-H14) to another (5005-H14). Slightly higher structural strength was a bonus value. Unusually broad aluminum stocks and technical resources often enable Ryerson to serve in this way.

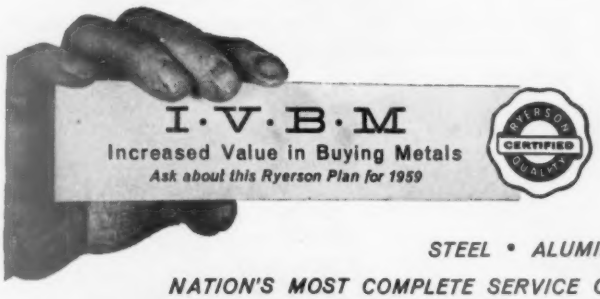
The need was urgent. A breakdown was cutting output of a big paint producer, and the steel needed to repair the break was not available in the area. However, the required analyses and size *was* on hand at the nearest Ryerson plant 200 miles away—and within an hour Ryerson delivered 100′ of this bar stock to the local airport. Three and a half hours after calling Ryerson in another state, the customer had his steel.

"Deeper cut, better finish, longer tool life, and lower total per-piece cost." These were the results reported by a Mass. machining company after it switched to Ryerson Rycut® 40 alloy steel for shafts, gears and spindles used in rugged machine tools. Ryerson Rycut steels are the world's fastest machining in their carbon ranges.

Missile component problem solved. Titanium stringers in stainless forged bars were creating a high reject rate for a missile parts manufacturer. His Ryerson specialist recommended a switch from Type 321 stainless to Type 347. Results: the same stabilized corrosion-resistance and strength—but no titanium stringers.

Furniture manufacturer saves 15¢ per unit on every chair produced. A *rolled* aluminum angle was being used where strength was not an important factor. A Ryerson aluminum specialist suggested an *extruded* angle which gave all the strength needed in the application, was more easily formed, had better appearance—and reduced costs as well.

These are just a few examples that illustrate the advantages that make Ryerson service truly unique. A call to your Ryerson representative may solve similar problems for you.



RYERSON STEEL®

Joseph T. Ryerson & Son, Inc., Member of the INLAND® Steel Family

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

For More Information Write No. 206 on Inquiry Card—Page 32





MAKE or BUY
Solve It the Linear Programming Way

Should work be subcontracted? Or should it be handled inside with overtime or by building stocks during slack periods. Linear programming provides a guide to the most economic answers to these make-or-buy questions.

By Spencer B. Smith

MANUFACTURERS with a seasonal pattern of sales usually have a scheduling problem. Purchasing and manufacturing schedules that are ideal for customer needs often result in high costs. In such cases, management can best meet customer requirements and control costs by:

(1) Subcontracting production of part of the requirements during the peak sales season.

(2) Working overtime during the peak season.

(3) Hiring for the peak period and laying off workers during the slack period.

(4) Manufacturing for inventory during the slack season.

Sales requirements can be met by an endless number of possible programs combining these activities in various ways. To determine which of these possible programs is the most economical has, in the past, been a formidable if not impossible task. Today companies are solving this problem by using modern methods of programming.

This is the third article on applications of linear programming by Dr. Smith. The author is employed as manager of business policy and methods research of the Semiconductor Division of the Raytheon Co., Brighton, Mass.

An Illustration

Consider the case of the Snowman Co., manufacturer of a line of air conditioning units for business and home use. The company operates a plant in Massachusetts devoted to fabricating three major components used in a number of the company's products. We will call these components A, B and C.

Owing to the nature of the company's business, demand for these components is low in the fall and winter and high in the spring and summer. Forcast requirements for the coming year are shown below. The company's fiscal year runs from October 1 through September 30.

Forecast Requirements, Units

Part	Quarter				Total
	First	Second	Third	Fourth	
A	200	300	320	420	1240
B	300	320	800	680	2100
C	400	400	1040	1040	2880

The problem is to determine how many A's, B's and C's should be purchased and manufactured each quarter so that:

1. Requirements will be met.

TABLE I

Period	Part	MAKE: First Quarter Regular Hours	First Quarter Overtime Hours	Second Quarter Regular Hours	Second Quarter Overtime Hours	Third Quarter Regular Hours	Third Quarter Overtime Hours	Fourth Quarter Regular Hours	Fourth Quarter Overtime Hours	Buy Hours	Required Hours
First Quarter	A	2.00 (20,000)	3.00							2.30	20,000
	B	2.00 (15,000)	3.00							2.50	15,000
	C	2.00 (10,000)	3.00							3.60	10,000
Second Quarter	A	2.18 (15,000)	3.18 (10,000)	2.00 (5,000)	3.00					2.30	30,000
	B	2.30	3.30	2.00 (16,000)	3.00					2.50	16,000
	C	2.36	3.36	2.00 (10,000)	3.00					3.60	10,000
Third Quarter	A	2.36	3.36	2.18 (29,000)	3.18 (3,000)	2.00	3.00			2.30	32,000
	B	2.60	3.60	2.30	3.30 (7,000)	2.00 (33,000)	3.00			2.50	40,000
	C	2.72	3.72	2.36	3.36	2.00 (24,000)	3.00			3.60	26,000
Fourth Quarter	A	2.54	3.54	2.36	3.36	2.18 (1,000)	3.18 (10,000)	2.00 (31,000)	3.00	2.30	42,000
	B	2.90	3.90	2.60	3.60	2.30	3.30	2.00 (29,000)	3.00 (5,000)	2.50	34,000
	C	3.08	4.08	2.72	3.72	2.36	3.36	2.00	3.00 (5,000)	3.60 (21,000)	26,000
Unused Hours		0	0	0	0	0	0	0	0	0 (280,000)	280,000
Available Hours		60,000	10,000	60,000	10,000	60,000	10,000	60,000	10,000	301,000	581,000

2. The plant's production capacity will not be exceeded.

3. The sum of production, purchasing and inventory costs will be a minimum.

Capacity of the plant is expressed in manhours, so it will be convenient to translate the forecast of requirements in units into one expressed in manhours. Parts A, B and C require 100, 50 and 25 manhours per unit respectively. Multiplying the forecast requirements in units by manhours per unit, we obtain the following forecast of manhour requirements.

Forecast Requirements, Man Hours

Part	Quarter First	Second	Third	Fourth	Total
A	20,000	30,000	32,000	42,000	124,000
B	15,000	16,000	40,000	34,000	105,000
C	10,000	10,000	26,000	26,000	72,000
Total	45,000	56,000	98,000	102,000	301,000

The plant can work up to 60,000 hours per quarter on regular time and 10,000 hours per quarter on overtime. We see that this is more than is required in the first and second quarters and less than is required in the third and fourth quarters.

The total requirement of 301,000 hours for the year is greater than the 280,000 hours which can be worked, so at least some of the total requirement must be met by subcontracting.

Vendors will supply A's at $330 per unit, B's at $275 per unit and C's at $140 per unit. In deciding which parts to subcontract, it is helpful to translate these prices into costs per man hour purchased. To do this we will deduct Snowman Company's material cost from the purchase price and divide the remainder by Snowman Company's man hours per unit.

Part	Purchase Price	Material Cost per Unit	Purchase Price less Material Cost	Man Hours per Unit	Cost per Purchased Man Hour
A	$330	$100	$230	100	$2.30
B	275	150	125	50	2.50
C	140	50	90	25	3.60

In order to evaluate possible programs of manufacturing for inventory in the early part of the year, the costs of storage, obsolescence, deterioration, insurance and interest associated with holding inventory must be considered. These costs amount to $18, $15 and $9 per unit of A's. B's and C's held for one quarter.

Express Carrying Costs in Dollars

As will be seen later, it will be useful to express inventory carrying costs in terms of dollars per man hour of production held for one quarter. Carrying costs may be obtained in this form by dividing the carrying costs per unit by the number of man hours per unit is shown in the following table:

TABLE II

Period	Part	MAKE								Buy	Required
		First Quarter		Second Quarter		Third Quarter		Fourth Quarter			
		Regular Hours	Overtime Hours	Regular Hours	Overtime Hours	Regular Hours	Overtime Hours	Regular Hours	Overtime Hours	Hours	Hours
First Quarter	A	2.00 (20,000)	3.00 1.00							2.30 0.30	20,000
	B	2.00 (15,000)	3.00 1.00							2.50 0.50	15,000
	C	2.00 (10,000)	3.00 1.00							3.60 1.60	10,000
Second Quarter	A	2.18 (2,000)	3.18 1.00	2.00 (28,000)	3.00 0.82					2.30 0.12	30,000
	B	2.30 0.12	3.30 1.12	2.00 (16,000)	3.00 0.82					2.50 0.32	16,000
	C	2.36 0.18	3.36 1.18	2.00 (10,000)	3.00 0.82					3.60 1.42	10,000
Third Quarter	A	2.36 0.06	3.36 1.06	2.18 0.06	3.18 0.88	2.00 0.18	3.00 0.70			2.30 (32,000)	32,000
	B	2.60 0.12	3.60 1.12	2.30 (6,000)	3.30 0.82	2.00 (34,000)	3.00 0.52			2.50 0.02	40,000
	C	2.72 0.24	3.72 1.24	2.36 0.06	3.36 0.88	2.00 (26,000)	3.00 0.52			3.60 1.12	26,000
Fourth Quarter	A	2.54 0.24	3.54 1.24	2.36 0.24	3.36 1.06	2.18 0.36	3.18 0.88	2.00 (0)	3.00 0.70	2.30 (42,000)	42,000
	B	2.90 0.60	3.90 1.60	2.60 0.48	3.60 1.30	2.30 0.48	3.30 1.00	2.00 (34,000)	3.00 0.70	2.50 0.20	34,000
	C	3.08 0.78	4.08 1.78	2.72 0.60	3.72 1.42	2.36 0.54	3.36 1.06	2.00 (26,000)	3.00 0.70	3.60 1.30	26,000
Unused Hours		0 (13,000)	0 (10,000)	0 0.18	0 (10,000)	0 0.48	0 (19,000)	0 0.30	0 (10,000)	0 (229,800)	280,000
Available Hours		60,000	10,000	60,000	10,000	60,000	10,000	60,000	10,000	301,000	581,000

Part	Inventory Carrying Cost per Unit per Quarter	Man Hours per Unit	Inventory Carrying Cost per Man Hour per Quarter
A	$18	100	$0.18
B	15	50	0.30
C	9	25	0.36

To complete our cost information, we need to know the average costs of a direct labor hour worked in the plant on regular time and on overtime. These are $2 and $3 respectively. We will assume that overhead costs are fixed. (If part of the overhead varies with the number of hours worked, a variable overhead cost per hour should be added to these figures.)

Table I shows how the data should be organized so that the problem can be solved by the "transportation method" of linear programming.

"Sources" of hours are listed across the top. Eight columns are devoted to manufacturing—make on regular time and make on overtime for each of the four quarters. The ninth source is "buy". Only one column is needed for "buy" as units will always be delivered in the quarter in which they are needed.

Hours available are listed across the bottom. For the "buy" column, 301,000 hours are available. This is the total number of hours actually needed since total requirements could be met by subcontracting. Adding across, we have 280,000 hours available from production and 301,000 from subcontracting for a total of 581,000. This figure is entered in the lower right-hand corner.

Part requirements are listed down the left-hand side. For example, the first three rows are devoted to requirements for A's, B's and C's during the first quarter. These requirements are given in terms of hours down the right-hand side.

The second row from the bottom is for unused hours or the difference between the number available and the number used. For this row the entry in the "required" column is obtained by subtracting the 301,000 hours needed from the 581,000 available. This leaves 280,000 which will be unused.

How It Works Out

Turning to the body of the table, we know that demand during the first quarter cannot be satisfied by producing units in the second, third or fourth quarters, so these squares are crossed out as being impossible. Similarly, "make" columns for the third and fourth quarters are crossed out in the rows for demand in the second quarter, and the "make" columns in the fourth quarter are crossed out for demand in the third quarter.

The remaining squares represent activities that are possible, and the next step is to assign costs per hour to these activities. We have already

Table III

Purchase and Production Plan

Part	A	B	C
First Quarter			
Starting Inventory	0	0	0
Make	220	300	400
Buy	0	0	0
Total	220	300	400
Demand	200	300	400
Second Quarter			
Starting Inventory	20	0	0
Make	280	440	400
Buy	0	0	0
Total	300	440	400
Demand	300	320	400
Third Quarter			
Starting Inventory	0	120	0
Make	0	680	1040
Buy	320	0	0
Total	320	800	1040
Demand	320	800	1040
Fourth Quarter			
Starting Inventory	0	0	0
Make	0	680	1040
Buy	420	0	0
Total	420	680	1040
Demand	420	680	1040
Ending Inventory	0	0	0

Production Hours

First Quarter	Second Quarter	Third Quarter	Fourth Quarter
47,000	60,000	60,000	60,000

determined the cost of buying an hour of production for three products, $2.30 for A, $2.50 for B and $3.60 for C, so these figures are entered in the subsquares in the "buy" column corresponding to demands for A's, B's and C's. We enter zero in the square for unused capacity as not buying costs us nothing.

In the "make" columns we enter $2.00 as the cost of a production hour on regular time in every square representing the use of production hours on regular time to satisfy demand in the same quarter. The overtime rate of $3.00 per hour is entered in every square representing the use of overtime hours to satisfy demand in the same quarter.

Zeros are entered across the row for unused capacity as we will not be paying for hours not worked.

The remaining squares are all devoted to making for inventory to satisfy demand in subsequent quarters. The use of these activities involves the cost of carrying inventory as well as the cost of the manhours used.

For example, the square in the seventh row and third column represents making A's on regular time in the second quarter to be held in inventory to satisfy demand in the third quarter. The cost of a direct hour on regular time is $2 and the cost of carrying one hour of production of A's in inventory for one quarter is $0.18. Therefore, the total cost per hour assigned to this square will be $2 plus $0.18 or $2.18.

As a second example, the square in the twelfth row and second column represents making C's on overtime in the first quarter to be held in inventory for three quarters to satisfy demand in the fourth quarter. The cost of a direct hour of overtime is $3 and the cost of holding an hour of production of C's in inventory for one quarter is $0.36. Therefore, the cost per hour to be entered in this square will be $3 plus three times $0.36 or $4.08.

Once entries have been made in this way in all the remaining squares, the organization of the data is complete and we are ready to solve the problem by the "transportation method" of linear programming.

Solving the Problem

The procedure for using the transportation method in finding the minimum-cost plan is exactly the same as was explained in detail in a previous article ("Practical Guide to Linear Programming," PURCHASING, Nov. 9, p. 70.) There it was applied to a problem in planning purchases from several vendors, but the method is unchanged.

The method may be summarized as follows:

- Develop a feasible program, that is one that will meet all requirements without exceeding any of the capacity restrictions. This program will not necessarily be the most economical.
- Determine the net effect on overall cost of assigning one hour to each of the squares not used in the first feasible program.
- If using any of the unused squares would result in reducing overall cost, develop a new program using the square which would make the largest reduction in cost per hour assigned to it.
- Repeat steps 2 and 3 until a program is obtained which cannot be improved. That is, introducing any of the unused squares would either increase or have no effect on total cost. This will be the minimum-cost plan and the solution will be complete.

A first feasible program for the Snowman Company's problem is shown in Table I, (see p. 70). The circled figures show how hours are to be allocated to satisfy sales requirements. The program calls for working the plant at full capacity of 70,000 hours each quarter and buying only 21,000 hours to meet demand for C's in the fourth quarter.

The total cost of this program may be obtained by multiplying the circled values by the costs in the same squares and summing. This comes to $689,940.

The Minimum-Cost Plan

By starting with the first feasible program and following the method of solution outlined above, we will arrive at the minimum-cost plan as shown in Table II.

The figures in the unused squares are the additional costs per hour which would be incurred if these squares were used.

By dividing the circled figures by the appropriate hours per unit we can translate the plan

(*Please turn to page* 194)

You're Never Too Small To Save

It's often said that you have to be big to use modern purchasing methods. A small company department shows that imagination is more important than size.



Arthur R. Matulis, purchasing director for Casting Engineers, Inc., says there is plenty of chance for profit-making purchasing in a small company provided you are willing to take a new look at old buying habits.

SUPPOSE YOU buy for a company with less than 200 employees; you spend only a million dollars a year but you are responsible for inventory control, personnel and plant safety as well as purchasing. You might feel that there isn't enough time for everything, and if there were, that there couldn't be much room for savings anyway in a small volume of mostly repeat items.

This isn't the way Art Matulis looks at the job. As purchasing director for Casting Engineers Inc., Chicago, he has found that modern purchasing techniques can be applied by the small company, and that they pay off. Five recent purchasing projects alone have produced savings of over $50,000 annually:

- A new approach to buying high temperature foundry flasks reduced their cost 54%;
- The price of platinum wire was cut 45% by a change in buying pattern;
- Value analysis of cut-off wheels and mounted points saved 20%.
- Changing shipping quantities cut the price of refractory sand in half;
- Up to $20,000 a year is saved by buying abrasives for maximum quantity discount wherever possible.

Casting Engineers is in the competitive investment casting business where cost-reduction is the main sales appeal. Although precision-made investment castings eliminate most subsequent machining their initial cost is still much higher than other kinds of castings. The company is therefore under constant pressure from cost-conscious customers to keep prices down.

Must Cut Costs

This means that profitable purchasing is a must. Matulis is successful at it because he combines the tools of modern purchasing with an imaginative approach. Like many other P.A.'s he thinks in terms of:

- Quantity discounts
- New sources
- Negotiation
- Value analysis
- Make-or-buy

But he doesn't see these as isolated methods, unrelated to one another. He treats each procurement problem as unique and uses as many approaches to it as possible. The more he can use the more likely he is to get profitable results. The foundry flask project is a good example:

When Matulis first became dissatisfied with the high prices he was paying for flasks he looked for another source. When he learned that he couldn't buy the finished flask for much less than his current costs he analyzed raw material and fabricating prices and considered a make-or-buy approach.

The heat-resistant metal purchased in prime sheets cost $147 cwt. Matulis was still not satisfied and eventually found a source of second and off-size material who would shear to size and deliver the sheets for $80 cwt. A fabricator formed and welded the flasks from this material. By looking at a purchased item in this new way Matulis saved his company over $13,000 per year.

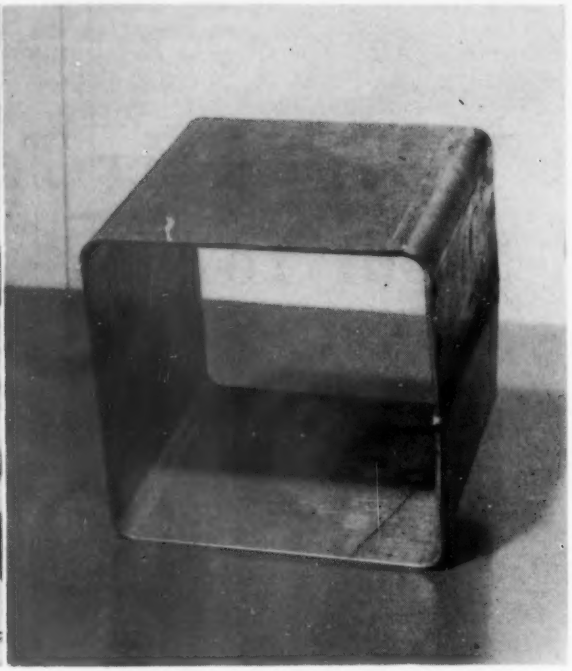
Buys Year's Supply

At 90¢ per inch a few thousand dollars worth of half-millimeter thick platinum instrument wire doesn't take up much room. Matulis felt it wouldn't hurt to buy a quantity larger than usual if it could mean a saving. At the same time he checked alternate vendors. The combined approach has resulted in an annual saving of $1200. He is now buying the wire from a new source—a year's supply at a time.

Matulis depends on cooperation with engineering and production



With the foreman of the dip coat and investing department Art Matulis examines a cluster of precision castings.



The cost of this refractory flask was cut to less than half by a complete change in purchase pattern.

to help him get the best possible quality and prices. "In our organization," he says, "the P.A. is responsible for inventory control and determines the quantities to be bought. So I have to maintain close contact with all departments."

This cooperation saves money. Casting Engineers uses mounted abrasive points in touch-up work. Manufacturing ran extensive tests on the rate of metal removal, point wear, and surface finish to help purchasing select a new vendor who would supply the required quality points at the lowest price. This cooperative effort brought about a reduction of 20% in the cost of points.

Manufacturing also ran performance tests on cutoff wheels. Wheels from eight different manufacturers were tried on different materials. Using the tests as a guide, Matulis dropped unsatisfactory suppliers and saved $7000 a year.

Gets Quantity Discounts

"'Check quantity discounts' should be a cardinal rule for all P.A.'s," says Matulis. "Our experience has shown that there is no end to the items where quantity discounts are available. All you have to do is ask. This is especially true of maintenance and mill supplies."

Following his own advice Matulis combines orders for similar materials to obtain the largest discounts possible and compares his inventory costs to determine the most economic ordering quantities. This often gives him additional savings on freight charges.

Ordering refractory sands in 17-ton loads instead of four-ton loads reduced the cost 50%. This is an annual saving of $7000. Buying abrasives to get the maximum discount when possible can mean a saving of up to 68% on a particular item.

Purchasing is constantly alert for new vendors. Sometimes this pays off in more ways than one. When uncertain deliveries forced him to look around for a new source for asbestos gaskets, Matulis frankly told the manufacturer what he was doing. Now he buys the gaskets from a newly appointed distributor and he not only gets them on time but the price is 11 to 15% lower than before.

Matulis does not confine his efforts to industrial supplies. Office supplies and printed matter are purchased on an annual volume basis. In this way he gets discounts based on his total purchases in a year instead of having to pay higher prices on small weekly orders.

Recently a company advertising campaign brought in a flood of correspondence and envelope requirements spurted suddenly. Matulis noticed that the $29.00 per thousand he was paying was beginning to add up to a lot of money. From past experience he knew that old buying habits are not always based on good reasons. He called in suppliers to investigate the grades and types of envelopes available and found he had been buying envelopes made of 100% rag bond.

Such high quality was not needed and Matulis selected a grade of envelope which has saved him 85% on subsequent purchases. And although he hasn't checked it out he feels the lighter weight is cutting mailing costs as well.



Push-Button Purchase Orders

The automated purchase order writing system used by Friden, Inc., automatically prepares 98% of needed p.o. information.

By Joseph Ehrstein

AN ALMOST totally automated purchase order system at the Rochester, N. Y. plant of Friden, Inc., (business machine manufacturer), is based on this premise: You can't pre-write purchase orders—but you can pre-write most of the information that appears on them.

We use edge-punched cards to capture virtually 98% of purchase order information. This means we can prepare our p.o.'s with a minimum of manual entries. Our experience proves that purchasing can be automated even when requisitions require quotations.

This degree of automation, we feel, is necessary in a situation where a purchasing department provides close support for manufacturing services. In effect, the purchasing department at Friden is a major artery, keeping a vital supply of materials flowing to every production area.

Mr. Ehrstein is director of purchases for Friden, Inc., Rochester, N. Y.

How System Works

Basically, the purchasing system is built around VISIrecord edge-punched cards which contain all the vendor and item information. These cards perform two important purchasing control functions for us:

(1) Along one edge, they contain perforated feed holes which make them compatible with automatic machines like the Flexowriter. The cards are made so that they can be punched and read by this type of machine. As a result, writing purchase orders is largely a matter of selecting the proper edge-punched cards and feeding them through the machines.

(2) Equally important, each card gives us a complete ledger and control record for the item or vendor it covers. In the case of item cards, we have ruled forms on the body of the edge-punched





Starting point of Friden's automated purchasing system is in the requisitioning department. Here a traveling requisition is pulled from vertical tub files.

In the purchasing department edge-punched cards are maintained for each vendor. Here a purchase order typist is pulling a vendor card from file.



The item and vendor cards are fed into the reader and the machine automatically reads the punched codes for preparation of the purchase order. About 98% of the data is prepared automatically in this way.

cards which enable us to keep a running purchase order history of materials. By glancing at the same card which acts as data input for order writing, we get all the information we need for a full management appraisal: A usage history of the item. We can spot trends in rising, falling or even seasonal usage.

We get the same advantage with our vendor cards which give us full information on all our vendors.

In both cases, card files are set up for high speed reference and filing in VISIrecord's vertical visible equipment. Housed in tub-type files, the cards are positioned by fixed guides which offset them so that indexing margins overlap. This makes it easy to pick out whatever card is wanted.

We feel that setting up proper input records is the most important aspect of an effective automation program. The starting point of the purchasing system is the production department. The originating department maintains its own supply of prepunched item cards. When a re-order is necessary, the correct card is pulled from its file.

The item cards thus serve as traveling requisitions. They are forwarded to the purchasing department where they are matched with corresponding edge-punched vendor cards, drawn from purchasing files.

The two cards—vendor card and item card—are all that are necessary to write the purchase order. The purchase order forms feed continuously through the machines, and by inserting the proper cards into the reader 98% of the information is entered automatically.

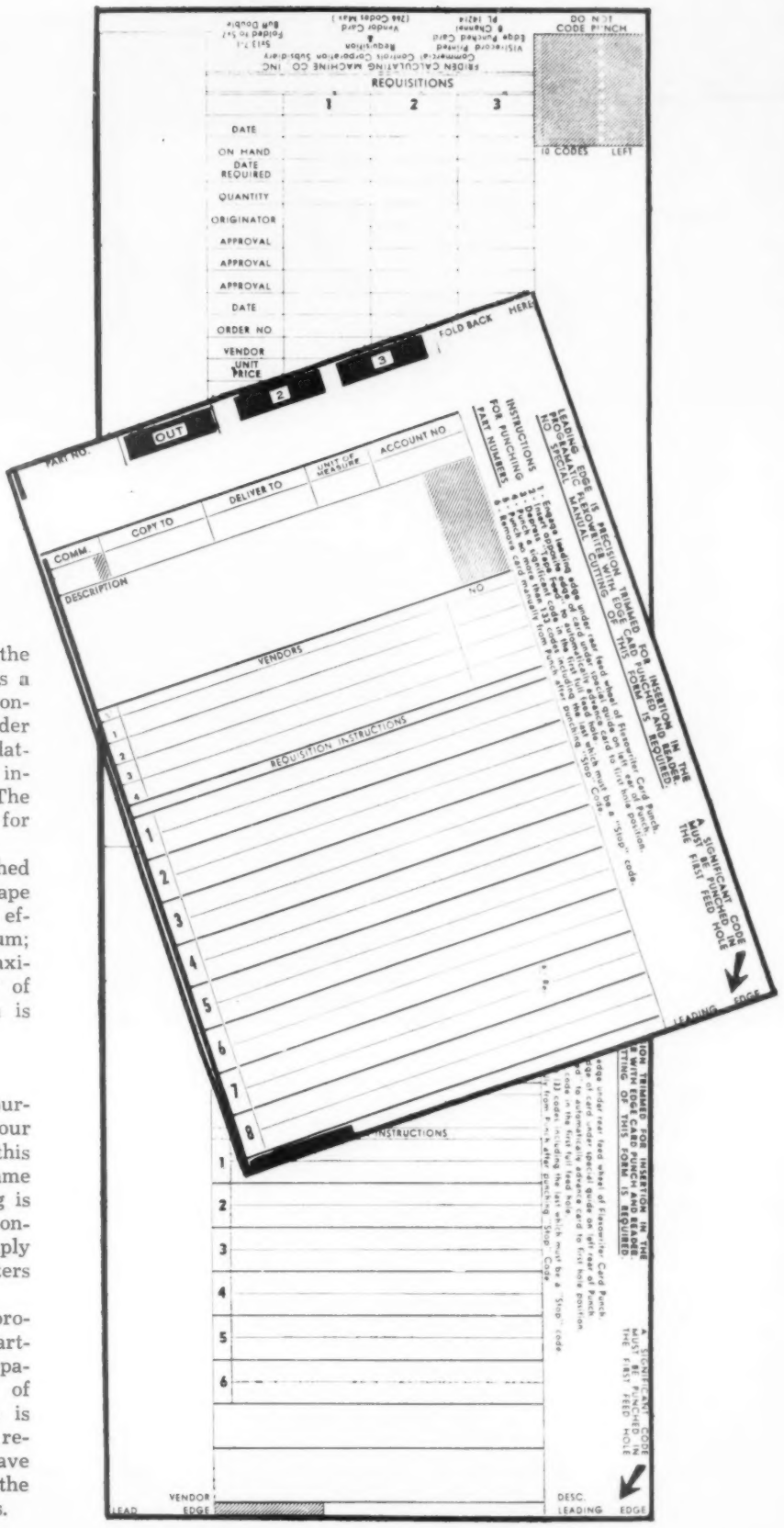
If quotations are needed, the same procedure is followed except that three vendor cards are used instead of one.

If Quotes Are Needed . . .

Rather than go through three separate steps, we use a specially designed form with block-out patterns to write all the bid requests at one time. Simply by feeding the correct item card and three vendor cards we can prepare all the necessary documents. The completed form contains individual copies for each vendor—plus an overall copy for our own records.

But automatic preparation of purchase orders or request forms is only the first phase of our system. In practice, we are set up to perpetuate information in every phase of purchasing.

As we prepare the purchasing



Edge-punched cards — one for each item and one for each vendor — have almost completely eliminated manual entries on purchase orders.

documents, for instance, the Flexowriter automatically cuts a by-product tape. This tape, containing selected purchase order information, is sent to our tabulating department and translated into standard punched cards. The cards, in turn, are processed for purchasing analysis.

In short, from the edge-punched cards we transfer data to tape and tabulating cards. Manual effort is reduced to a minimum; accuracy is raised to the maximum. We have the security of knowing that all information is verified and pertinent.

Automatic Expediting

As far as follow-up of purchase orders is concerned, our basic system also controls this phase of operations. The same tape that is sent to tabulating is also used to make expediting control cards. These cards simply tell us to write follow-up letters at specific intervals.

We also use automated procedures in our receiving department. Rather than prepare separate documents for control of shipments, the original tape is used to create the various receiving forms. This way we save time and effort—and insure the accuracy of the entire process.



Sessions were underway early in the morning when the sun was low and continued until after sunset.



Most participants, like Paul Hoppe of U. S. Gypsum, took notes at each session.



Participants were alert in every formal session; their penetrating questions stimulated the faculty. At this session Jim Yoder (with hand outstretched, left) asks Dean Ammer, executive editor of Purchasing Magazine a question about purchasing's role in the materials management organization.

Seminars Help Sharpen Materials Management Skills

ONE OF THE most comprehensive materials management seminars ever held took place last month at Michigan State University's Kellogg Center in East Lansing, Michigan. Twenty eight purchasing men from sixteen different states attended. For two weeks they thought and talked materials management from breakfast to bedtime.

The day started at 8:15 am with a management gaming exercise. Each participant was a member of a team and each team managed a company with specific materials management problems. The decisions made by the team were then tabulated on the Uni-



The interest shown by Sid Sibbing, Rog Weller, Roy Wendell and Russ Cloud at this session was typical of almost all the meetings.



Students learn first hand about careers in purchasing at a special panel session which gave them a chance to meet purchasing agent seminar participants. Here, students Charles Sharpiro and John Mezo have coffee with P. A. Bill Eck.



Dr. John Hoagland, director of the materials management seminar, leading a session on business forecasting.



Teaching talent was top notch. Here, discussing purchase analysis is Jack Peters, assistant to the vice president, U. S. Steel. Mr. Peters originally established the Corporation's purchase analysis program.

versity's "Mystic" computer which rated the team's results on a competitive basis with other teams.

Following the gaming session, there were instruction sessions consisting of two 1½ hour classes both in the morning and afternoon. Evenings and mealtimes were devoted to "homework" and informal discussion of ideas presented in the lectures.

The faculty for the seminar was drawn from both the academic and the business world. Each was a genuine expert in his specialty. Directing the seminar was Dr. John Hoagland; assisting him was Dr. Harold Fearson.



Questions kept the meetings humming. Here, checking a point is Stan Kurpieski, West Penn Power Co.; beside him is Dave Adler, Hawaiian Telephone Co.



Purchasing's Part in R&D Breakthroughs

If purchasing moves in at the beginning on research and new product development, it can do a lot to reduce costs and to prevent many of the problems that so often arise in this field. Here's how one large chemical company benefits by having purchasing in at the start.

By Alan J. Frankel

DOES VALUE ANALYSIS mean real savings or merely elimination of yesterday's losses?

Suppose that before the product under analysis had been ordered for the first time, a thorough study had been made. And suppose at that time we had asked "What, Why, When, Where, and How?" Would today's analysis be as fruitful? In many cases, the answer would be a positive "No".

But can we effectively study raw materials we have never bought to be used in products we have never sold? The answer is just as positively "Yes". A new product and all its parts should be analyzed from every angle during the research and development stages. Furthermore, purchasing has a very important part in the study.

Introduction of a new product is a major undertaking. The research department studies the new item and proves that it can be made; engineering demonstrates that laboratory-scale work can be expanded to larger-scale production; sales makes surveys to determine whether a market exists or can be created; and management agrees that funds can be made available for capital expansion.

If purchasing also takes part in the product development, all should go well. But if purchasing has not been consulted until the project reaches its final stages, all kinds of problems can arise. These include:

(1) Vital materials required for plant construction or modification may not be readily available or may not even be items of commerce.

(2) Required raw materials may be in short supply or may not be available at all.

(3) The quality of commercially offered materials may not be up to required standards.

(4) Start-up may be relatively trouble-free, but within a comparatively short period it may become evident that raw material cost changes which could have been predicted have milked the operation of anticipated profits.

What Purchasing Can Do

These problems should rarely occur if purchasing has played its part in the research and development stages. For instance, here is an example of the role purchasing can play—based on our experience at Monsanto:

Suppose a research chemist reasons that any one of several alcohols can be reacted with a particular acid to give a new plasticizer for polyvinyl chloride. Based on his own knowledge and the belief of the sales depart-

Mr. Frankel is purchasing agent at Monsanto Chemical Company's St. Louis office.

ment that a market probably exists for this material, the chemist gets the go-ahead to test the synthesis.

Purchasing starts helping right at the beginning by procuring small quantities of the alcohols and the acid, plus technical data sheets and price lists. Purchasing can often help in other ways at this point in the research project. For example it may be that one of the materials required by the chemist is not listed in any buyer's directory. The chemical buyer, with his broad knowledge of the industry, can generally find a company which has made this material in the past or which could make up an experimental sample.

Another benefit from consulting purchasing in the early stages —particularly in a large or diversified company—is that security can be better maintained on the new product until patent or other protection is achieved. Many research personnel are so well known in their fields that any inquiry they may make can be a premature tipoff.

Purchasing Checks Competition

Assume that the chemist is able to make the synthesis and is able to describe, in a general way, the properties of the materials he has produced. Before doing any further work, a rough economic evaluation must be made to determine whether additional research and engineering dollars should be spent. The sales department is consulted to determine the price range in which a material of this type might sell and the volume of sales which can be predicted. Engineering will also be consulted to get a rough idea of plant costs. Competitive products—easily procured by purchasing—may be compared with the new materials.

While purchasing was procuring samples and technical data, it is probable that price lists also were received for many potential raw materials. With a better idea of potential volume, purchasing can analyze the market for one or more of the possible raw materials and, after working with vendors, tell research the prices which will have to be paid. For products which are new on the market, purchasing can work with potential producers to firm up volume-price relationships.

At the same time that the P.A. is investigating prices, he also determines present and future availability. No company can pour money into the development of a new product until it is reasonably certain that the raw materials required are readily available.

While the purchasing agent is investigating price and availability, particularly of currently produced materials, he can frequently pick up valuable information—such as competitive uses for these materials, market conditions, trends for both the raw materials and the products into which they go, alternate raw materials, etc.

This information can be of direct use to purchasing, and much of it may be of use to research, development, and sales to fill gaps in their knowledge. In addition, vendors are frequently willing to supply information concerning methods of manufacture which may be helpful in providing a better understanding of mutual problems.

If the information coming in from the various sources indicates further work is needed on the new product, research does more process development, product evaluation, and makes additional application studies. Finally it makes a pilot plant or demonstration run. Purchasing continues to be of assistance here by obtaining additional samples, technical data, and pilot plant quantities of raw materials. If necessary, the buyer can arrange meetings between technical people of his own company and potential vendors to discuss processing problems.

Call in the Buyer

During the research and pilot plant stages, sales or development has probably been supplying small quantities of the product to potential customers for test marketing purposes. If indications are good, engineering will start studies directed toward plant modification or construction. When this happens, it is time to call in the equipment buyer and get his assistance in developing specifications and sources for the equipment. Over- or under-building can ruin the future profit picture as easily as rising raw material costs—particularly if performance is measured by return on capital investment.

Once all cost studies and sales evaluations are in and good profit potential is indicated, management must be asked for the funds required to build or modify a plant. The appropriation request will tell management the estimated capital requirements, oper-

(*Please turn to page* 190)

What Purchasing Can Do on R & D Projects

If purchasing gets in at the start of new product development, there are many ways it can help. Here's a brief outline of areas where purchasing's unique talents and experience can help a new product get off the ground:

(1) Purchasing can line up sample quantities of required materials, research sources for new items that may not be readily available.

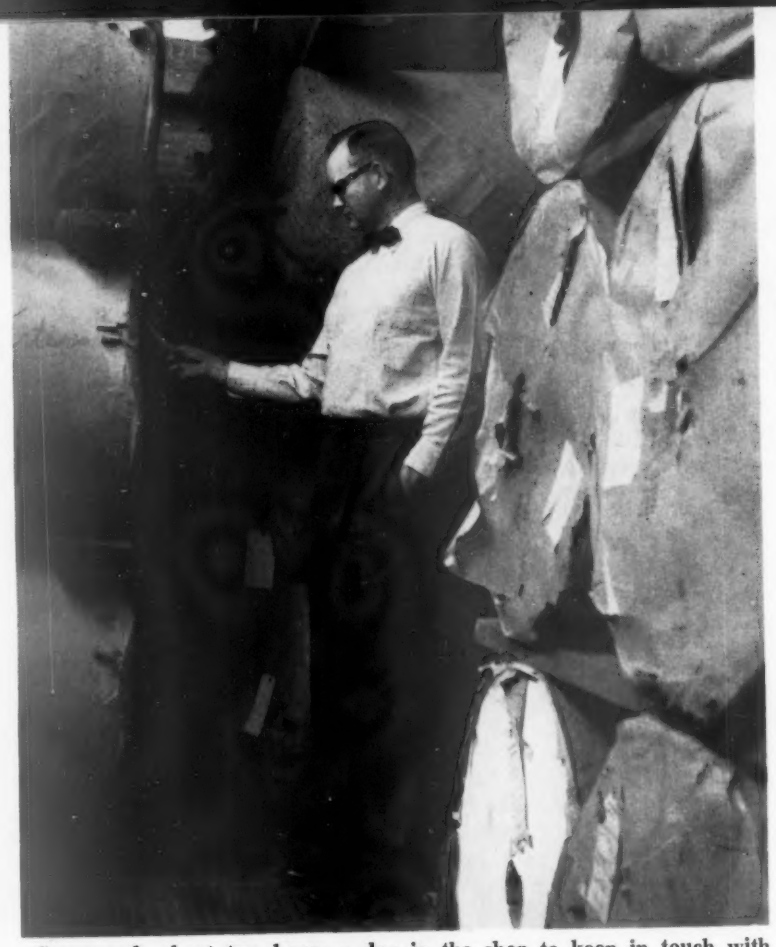
(2) Buy competitive products for price and quality comparison.

(3) Develop fairly accurate material cost figures based on production estimates.

(4) Thoroughly investigate supply sources to make certain materials will be readily available over a long period of time.

(5) Arrange meetings between suppliers and his own technical people to work out specific problems.

(6) Make a forecast of future price trends for raw materials that will be used in the new product.



Cox spends about two hours a day in the shop to keep in touch with company activities. Here he inspects fabric inventory.

Cutting Paperwork in a One-Man Department

If you hate it enough, you can probably do an effective job of reducing paperwork. Here are some specific techniques that may help.

By John Van de Water

CHARLES H. "PETE" COX is a purchasing agent without problems. "I don't know what's wrong with me," says Cox. "I read about all the problems other people have, but I don't have any."

But there is nothing wrong with Pete Cox, who is P.A. for the Synthane Corporation, manufacturer of laminated plastics at Oaks, Pa. His one-man, one-girl department is progressive and efficient. It is run with a minimum of clutter.

Hates Paperwork

Paperwork is Cox's pet hate. "It doesn't take a lot of paper to buy well," he declares. "I prefer to do my work the easy way." Applying this straightforward approach he:

- Has cut order writing by 25%.
- Has introduced the traveling requisition.
- Has set up a unique vendor reference file.
- Figures his own requirements for production materials.

By consolidating orders and increasing quantities Cox has been able to cut order writing by 25%. About 15 orders are now written daily compared to 20 per day a year ago—and that was achieved in the face of booming business.

At Synthane the traveling requisition is already in use for 3500 maintenance items. "Traveling requisitions are terrific," says Cox. "They cut down the number of pieces of paper you have to handle." In a few months the system will be working for production materials: some 350 items of fabrics, glass, paper and resins.

Know Your Company

As P.A. for a medium-sized company (740 employees), Pete Cox is in the enviable position of knowing his company and its products intimately. He started in the shop 25 years ago, spent five years in the laboratory and got his present job in 1950. He still spends about two hours a day in the shop and in this way is able to keep in close touch with company activities.

Although the Synthane purchasing department does not have official control over inventories, Cox decides the quantities to buy for all production materials. "I more or less play it by ear," he says. "I know how much we will consume on the average and I know what the dollar sales bookings are for each month." In addition he keeps his own inventory record to tell him what production materials are on hand. Once the traveling requisition is instituted Cox will keep an inventory card in his own office while the actual

requisition will be filed by the inventory department.

Cox works directly with the foreman of the coating department in figuring out his requirements. "We sit down together and I give him a rundown of the market situation and then we decide how much we'll need for a given period. We buy resins once a month but our purchases of fabrics are determined by market conditions. In May we bought our fabrics for the rest of the year. Although we don't speculate, we thought we could get a good buy on what we needed, so we contracted at a firm price for the rest of 1959."

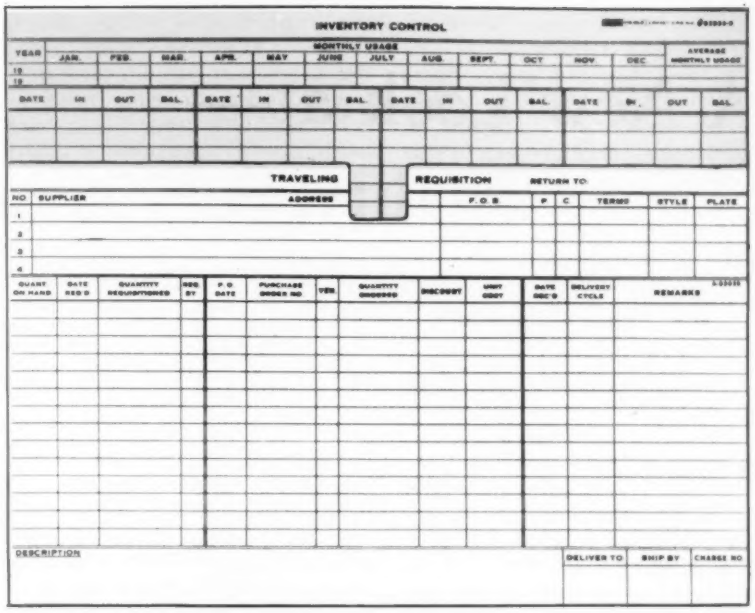
No Calling Cards

About four sales representatives call on Synthane every day. "I like to see everyone who calls," says Cox. They can often give you good ideas and you never know when you'll need what they sell."

Instead of collecting calling cards, which he considers all but useless, Cox has developed a supplier's information form which is printed on the front of a standard file folder. On this form the salesman fills in his company's name, address, products, distributors and other pertinent information. Vendors' bulletins and descriptive material are placed in the folder which is filed by commodity classification. A further note indicates whether other catalogs, too large for the folder, are on file in the department. At present Synthane has a vendor reference file of over 700 folders.

The company maintains excellent vendor relations. "We try to avoid getting in the position where we have to cry wolf," says Cox, "except maybe once a year when we really have a problem." He does little expediting. "If we do, it's rarely because the vendor goofed: usually it's a case where we didn't order in time."

But at Synthane, goofs in the purchasing department are few and far between. Pete Cox has his department—meaning himself—pretty well organized.


INVENTORY CONTROL

MONTHLY USAGE

YEAR | JAN. | FEB. | MAR. | APR. | MAY | JUNE | JULY | AUG. | SEPT. | OCT. | NOV. | DEC. | AVERAGE MONTHLY USAGE

19
19

DATE | IN | OUT | BAL. | DATE | IN | OUT | BAL. | DATE | IN | OUT | BAL. | DATE | IN | OUT | BAL.

TRAVELING REQUISITION RETURN TO:

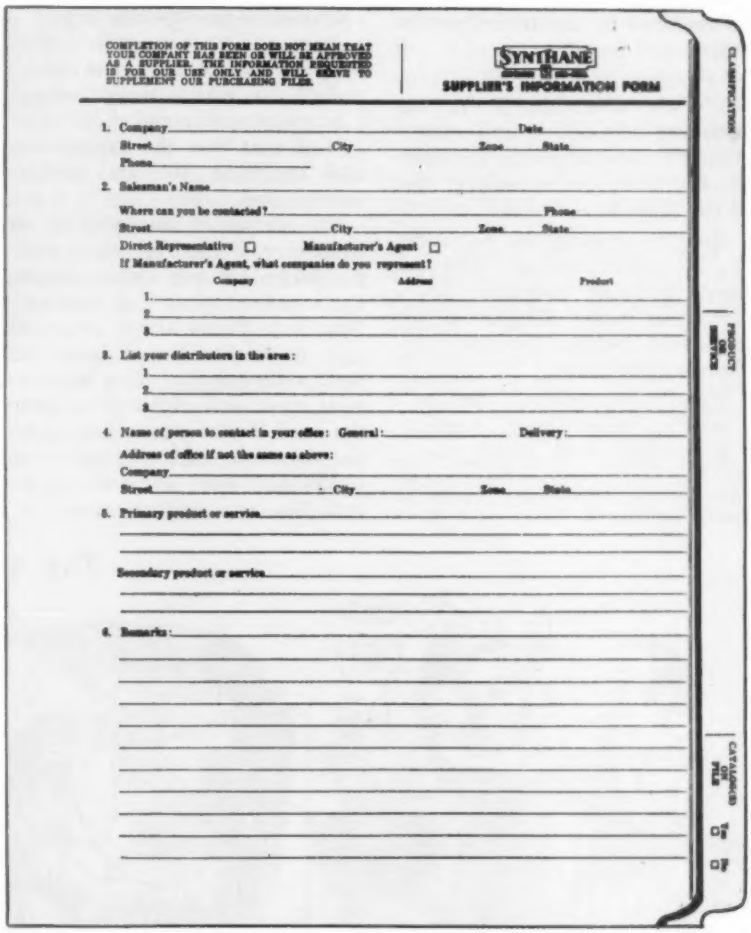
NO | SUPPLIER ADDRESS | F. O. B | P | C | TERMS | STYLE | PLATE

1
2
3
4

QUANT. ON HAND | DATE REQ'D | QUANTITY REQUISITIONED | REQ. BY | P. O. DATE | PURCHASE ORDER NO | VEN | QUANTITY ORDERED | DISCOUNT | UNIT COST | DATE REC'D | DELIVERY CYCLE | REMARKS

DESCRIPTION | DELIVER TO | SHIP BY | CHARGE NO

The traveling requisition and inventory control card will soon be used for all purchased items.


COMPLETION OF THIS FORM DOES NOT MEAN THAT YOUR COMPANY HAS BEEN OR WILL BE APPROVED AS A SUPPLIER. THE INFORMATION REQUESTED IS FOR OUR USE ONLY AND WILL SERVE TO SUPPLEMENT OUR PURCHASING FILES.

SYNTHANE

SUPPLIER'S INFORMATION FORM

1. Company _____ Date _____
Street _____ City _____ Zone _____ State _____
Phone _____
2. Salesman's Name _____
Where can you be contacted? _____ Phone _____
Street _____ City _____ Zone _____ State _____
Direct Representative ☐ Manufacturer's Agent ☐
If Manufacturer's Agent, what companies do you represent?
Company Address Product
1. _____
2. _____
3. _____
3. List your distributors in the area:
1. _____
2. _____
3. _____
4. Name of person to contact in your office: General: _____ Delivery: _____
Address of office if not the same as above:
Company _____
Street _____ City _____ Zone _____ State _____
5. Primary product or service _____
_____
_____
Secondary product or service _____
_____
_____
6. Remarks: _____
_____
_____
_____
_____
_____
_____
_____
_____
_____

CLASSIFICATION

PRODUCT OR SERVICE

CATALOGUED FILE

All vendor information is kept on a form printed on standard file folder. Product bulletins are filed inside.

A New Look at— Quality, Service and Price

By Eugene S. Page

MOST PURCHASING agents pride themselves on making impartial buying decisions based on quality, service, and price. All too often, however, they don't know what these words really mean.

These three words are actually not the right ones. They should be replaced by the term "performance and costs".

"Purchasing is a profit-making job" only when the P. A. has adequate knowledge and understanding of performance and costs of—his own, his suppliers, and of the item he is buying.

Quality is really the beginning of all-manufacturing, procurement, and cost problems. It's a word that means different things to different people. The dictionary defines it this way:

"Quality—attribute, characteristic, class, kind, grade, distinctive tract, power, capacity, or virtue—."

Mr. Page has 20 years' purchasing experience and has written many articles on purchasing subjects.

This explanation is satisfactory for general usage. But as a purchasing agent you have a special purpose that joins this word with service and price. For industrial purchasing the following is a more accurate definition of quality:

Quality is the capacity to perform and to accomplish efficiently and at economic cost, that for which design and purchase are intended.

Note that here the explanation and emphasis are on "performance" and "cost."

The value of anything is in what it will do. Nothing is ever purchased for any other reason. Put a new set of tires on your car. You buy 20,000 miles or so of safe, resilient riding. Fill up the tank with gasoline. You buy energy that will drive you over the road. To the purchasing agent the materials and machines on his orders are only a means to an end. He buys Performance.

This brings up the question of what "performance really is. The dictionary defines it this way:

"Performance—the act of performing—often effective operation, as of a motor—".

But the purchasing agent needs a more explicit definition, such as:

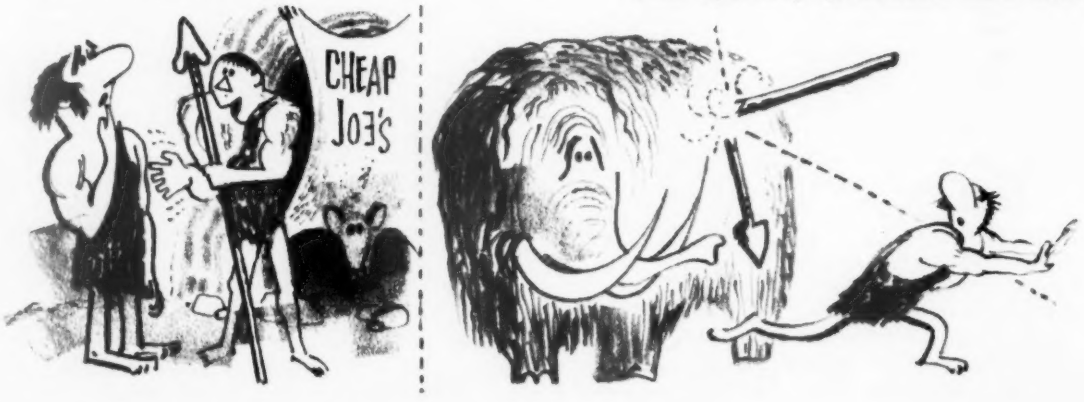
Performance is the result of being or of action in terms of accomplishment and endurance.

Let's assume you are going to buy a portable fire extinguisher to hang on the wall. There it remains, motionless. But if you have bought the right kind of extinguisher it performs, that is, gives its measure of protection against the spread of any fire by being always available.

But if it leaks or rusts or in some way becomes partially deficient or inoperable, it does not perform well. It has inadequate "endurance".

Suppose a fire breaks out. The extinguisher responds, by auto-

The quality problem has been



matic or manual means, and the fire is brought under control. This is performance by designed action. But suppose the contents of the extinguisher had been exhausted before the fire had been put out. This would be a failure in performance. It did not accomplish its second purpose. Either it was inadequate through lack of "endurance" or the performance that it was designed to give was not the performance required.

State the Problem

The truth is that before you can purchase for performance, you have to know what performance is required. This is fairly complex. As our definition shows, it consists of accomplishment and endurance. Let's begin there:

There are two kinds of accomplishment, "quantity" and "quality."

Quantity, of course, is volume, rate of production, or speed of operation. Coal with a high B.T.U. content burned under a boiler will give more pounds of steam per ton than coal of lower B.T.U. content. But first the quantity of steam required per hour must be known, plus other quantity characteristics.

Suppose you want to buy a machine tool? The first determination is that of quantity: speed of cutting, shape and maximum dimensions of work pieces, and number of units to flow through the machine per unit of time. Quantity is how much you want to do, and how fast.

Quality specifications always limit specification's based on quantity. The boiler requires not only so many pounds of steam per hour but the fuel must be of low sulphur analysis to minimize corrosion, of low ash with high fusion point to reduce the removal problem, oil treated to eliminate dust, and of a size to bank on the boiler grate. Your machine tools shall produce finished parts within a known range of dimensional tolerances.

Whatever you want to buy must first be fully defined in terms of both quantity and quality.

Vendor Responsibility

You will want to purchase for performance. Many a manufacturer or producer does warrant that his product is free from defects in original workmanship and material. He may promise to repair or replace, without charge, any product of his found deficient within a stipulated period. Is this a guarantee of endurance? No. The vendor merely has said that whatever performance for production or for operation has been built into his product shall not be reduced or removed by an original defect. Normally the vendor does not accept responsibility for anything other than this.

Suppose you buy a 10 horsepower motor? The manufacturer warrants that under certain conditions it will drive a 10 hp. load. But whether your load is 10 hp., or more or less, is for you to determine. Performance responsibility is yours.

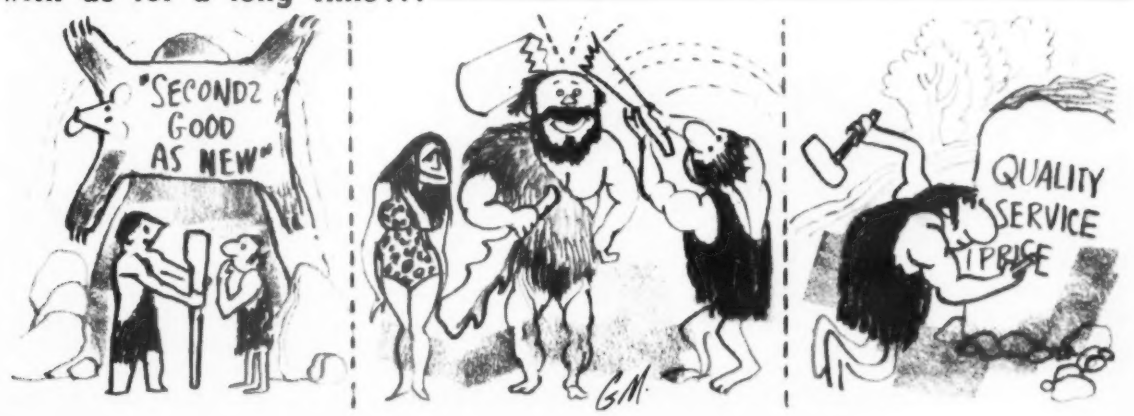
As we all know, every purchase has to be requisitioned or "authorized". Whoever issues the requisition must know, and be able to demonstrate, that the material, commodity, equipment, or service should be acquired and is necessary for economic or safety reasons. This comes even before the make-or-buy decision in which the P. A. has a basic interest. Justification for acquisition is a responsibility and a job outside the purchasing department, but of direct influence upon it. Justification determines that something has to be done. This something is the P. A.'s performance requirement to which he will try to match what is available in the products or services of his suppliers.

Next in his buying decision the P. A. considers—"service". "Service" is the "quality" of the vendor, that is, his capacity to perform and to accomplish for you in your negotiation, purchase, and use of his products. Therefore, again, "service" is "performance". Is this performance of the vendor subject to the same analysis as performance of his products? Certainly. And, if service really is a factor in the buying decision, evaluation in this manner is essential. What can the supplier do for us?

As part of his selling effort, a vendor may provide valuable assistance and service, based on experience and his resources in testing facilities or laboratories. For instance, an alert supplier may:

(1) Assist in the justification of the purchase of material or equipment, by a significant reduction in purchase price or operating cost, increase in the "qual-

with us for a long time...



ity" of your products or the "service" your company can perform, or by providing desirable safety factors;

(2) Suggest how much costs may be lowered by:

(a) Revision of specifications and standards through "value analysis", substitutes, or complete elimination;

(b) Different methods of packaging, transportation, and materials handling;

(c) Bulk purchasing—with full consideration of problems of scheduling, transportation, inventories, and price protection;

(3) And finally, negotiate and accept a purchase offer that truly is a mutually beneficial transaction from the standpoint of quality, service, and price.

When a deal has been made, the "serviceable" vendor not only does his part fully, he does it on time and he keeps the purchaser, informed of progress. Real vendor service at this stage means contract performance and good dependable communication.

Even after an order has been completed, a good vendor can help you—and himself—by following this program:

(1) Keep in touch, inspect for performance of his products in your shop, advise on the best ways to store, use, and maintain;

(2) Honor any valid claims against defective materials or workmanship promptly and efficiently;

(3) Stock vital parts, or emergency supplies, within reach of your plant, and offer for immediate shipment at "reasonable" prices;

(4) Communicate market data and technological developments that bear upon your continued economic use of his products.

To be sure, no vendor does all of these things all the time. No buyer can expect too much. Judgment is necessary. But nonetheless these are the "services" a supplier can give. These are your guides in measuring his performance.

Next in the triumverate of quality, service and price is price. There's nothing vague here, a common language and a national standard, the dollar. And we purchasing men do pride ourselves on not paying too much.

But what is the right price?

"The right price to pay is the lowest available delivered net price that will obtain for the purchaser, from product and vendor, performance that will meet minimum requirements at the lowest total cost."

Let's analyze price on this basis:

(1) "Lowest available" means you have thoroughly studied the market and developed truly competitive sources and bids.

(2) Only the "delivered" price counts; or with machinery this may be "delivered and installed."

(3) "Net price", of course, is the amount paid after all discounts including that for "cash" within, say, ten days.

(4) "Product and vendor performance" we already have talked about. Note that performance is essential to comparison of competitive prices and to the final determination of what price to pay. There is no other basis.

(5) "Minimum requirements" we also have discussed. These, of course, are performance requirements, and it is important to meet the minimum. This means you must know what you want, to buy at the right price.

(6) But what is the "lowest total cost?" Who knows? This is the stumbling block, and you will have to look hard and deep for the answer. Here we shall review the principal parts of such cost.



"All those in opposition say, 'I quit'."

One thing more to notice. Our definition of "the right price" does not mean you have to purchase. The make-or-buy evaluation and decision are involved, and your right price may come from either source.

Your total costs for the things you buy are of two kinds: the cost of possession and the cost of use. To establish your total costs you should check these points:

A. Cost of acquisition consists of:

1. Procurement expense, or the cost of your purchasing department in salaries, space, supplies, and other expenditures; plus—
2. Cost of what is purchased (or leased), and this consists of:
   (a) Price at shipping point (vendor's costs plus profit), plus
   (b) Transportation costs, plus
   (c) Preparation for use, such as
   Unloading
   Materials handling
   Temporary storage
   Installation
   Startup
   Employee training

B. Cost of holding consists of:

1. Finance costs, such as:
   (a) Depreciation (of machinery), plus
   (b) Leasing costs, plus
   (c) Interest, on owner's investment or borrowed funds, plus—
2. Inventory costs:
   (a) Shelter, plus
   (b) Materials handling, for equipment and facilities, operations, and maintenance, plus—
   (c) Constantly decreasing value through depreciation, obsolescence, or loss.

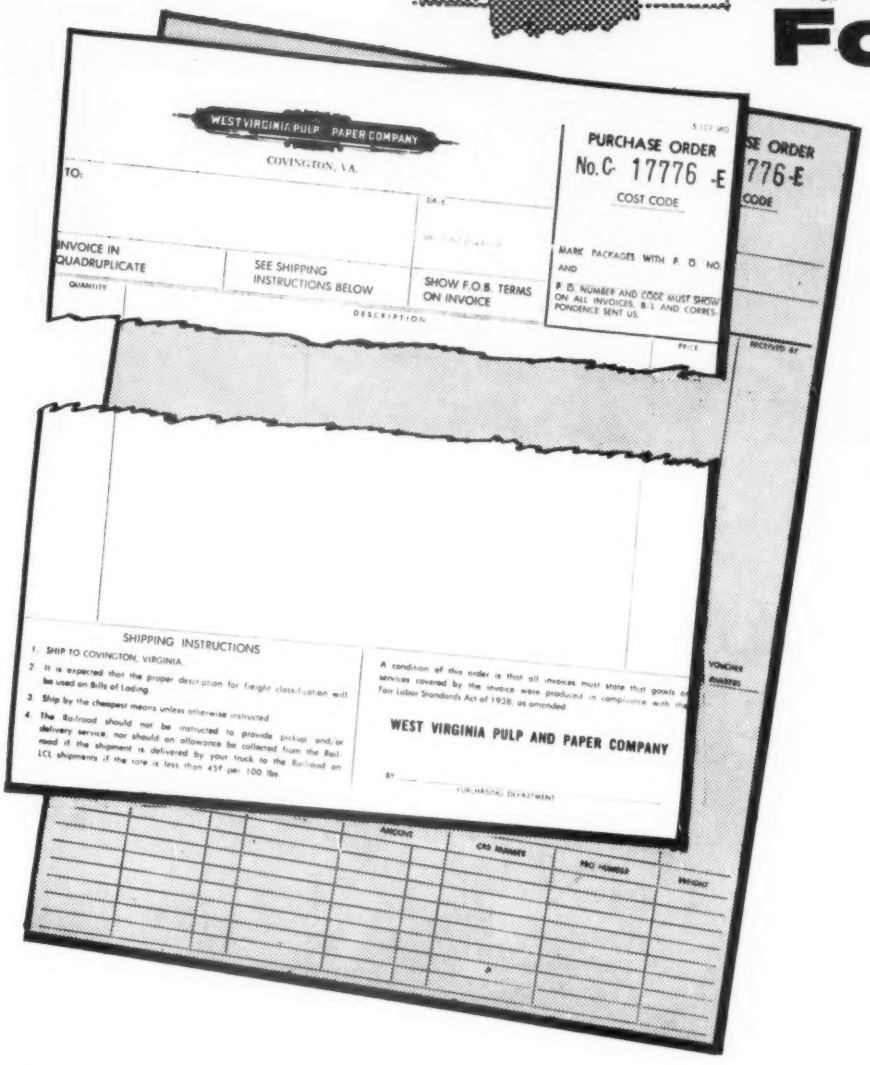
C. Cost of disposal consists of:

(1) Procurement expense (as in acquisition), plus—

(2) Cost of sale, including preparation, loading, transportation, and seller's commission.

(*Please turn to page* 192)

Forms Forum



A seven-part purchase order form used by West Virginia Pulp and Paper Company. The third copy serves as a master for the receiving department. Reproductions are made on standard office copying machines.

THERE'S certainly more than one way to solve the partial shipment problem. But Virginia Pulp and Paper Co., Covington, Va., seems to have come up with one of the simplest and most effective solutions.

Partial shipments receive a great deal of attention at Virginia Pulp because roughly 40% of its orders involve more than one delivery. The company's previous practice on partial shipments was to make out a special report on every delivery. But now the system has been simplified so that all that's needed is the receiving copy of the purchase order which serves as a master copy. The master is used to make delivery tickets, stores file-copies and receipts for purchasing and accounting.

In operation here's how the system works: After the purchase order is made up, the third copy of the six-part P.O. form is sent to receiving where it is kept in an open file. If a complete shipment is made, the p.o. copy is pulled from the file, delivery information is entered, and three copies are run off on a standard office copying machine for distribution to various departments.

On partial shipments, the master is pulled and again delivery information is entered. Copies are distributed the same way as with full shipments, however, the master is refiled in the open file.

This procedure is repeated on subsequent shipments until the order is filled. As a result of this system, Virginia Pulp is able to use one form for many purposes and, at the same time it eliminates repetitive writing of basic information.



At Resistoflex almost every buy is a special and it's almost always rush. This kind of operation creates a lot of purchasing problems and makes cost control especially difficult.

Price Variance Reports Keep Purchasing Cost Conscious

JUST ABOUT everything Resistoflex Corp., Roseland, N.J., buys is a rush special. That's the nature of the aircraft-missile business. It means a lot of problems. Cost control is especially difficult because so often the buyers are making first-time purchases.

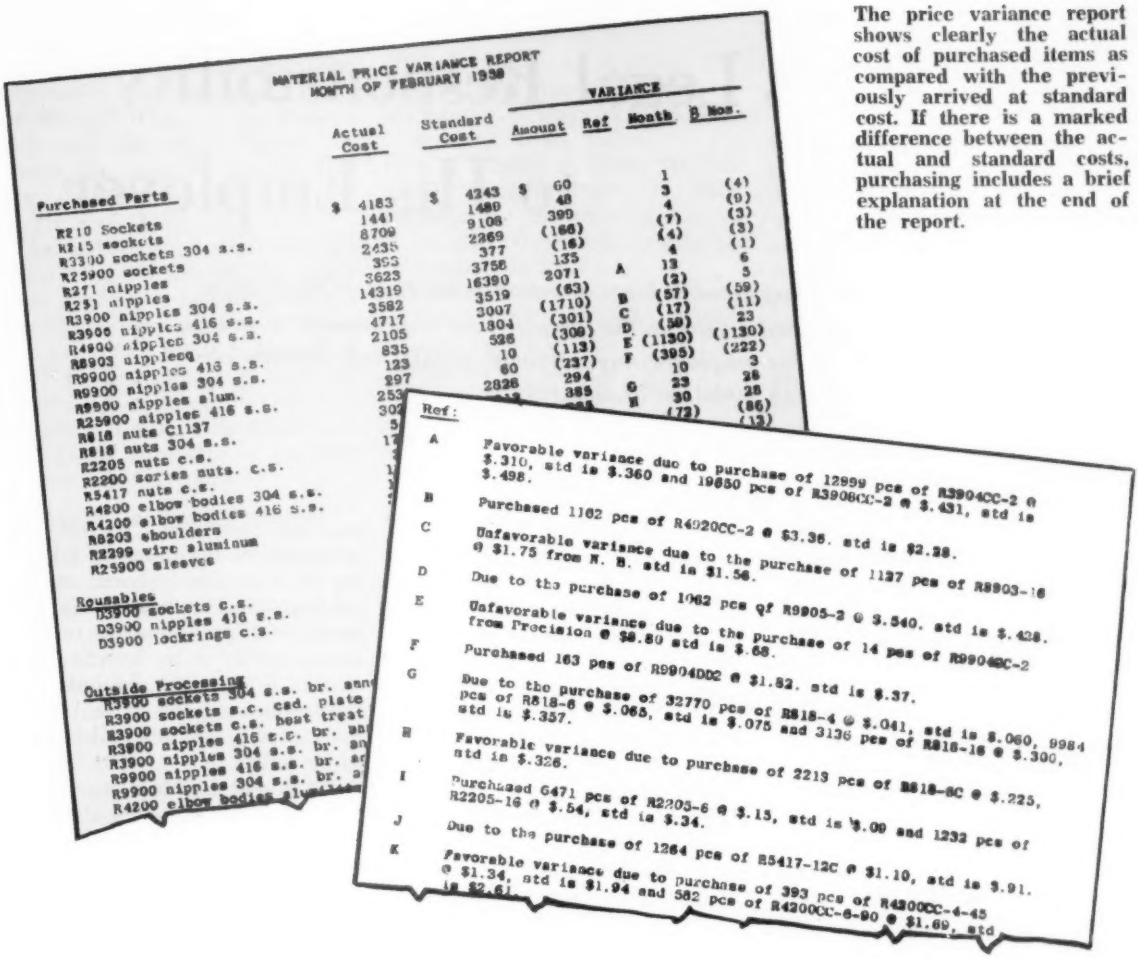
But this hasn't stopped Resistoflex purchasing from trying to put cost control on as scientific a basis as possible. After a careful study of previous purchases, P.A. Rube Atkins realized that about one-third of the specials were ordered often enough so that relatively speaking—they were standard items. He singled out these items for an intensive cost control program.

Working with the cost accounting department, he set up price standards for these "regular" items. This was the starting point for a monthly Material Price Variance Report which is sent to all of Resistoflex's top executives. The report (see cut) consists of a listing of the "standard" items purchased during the month, the amount paid for them, the standard cost of the items, and the difference between what was actually paid and the previously established standard.

Shows Purchasing Efficiency

On any buy where the actual cost differs from standard, purchasing has to supply a written explanation for the variation.

Having to make this kind of report naturally puts a lot of pressure on purchasing. It's especially tough when you are buying in rising markets. But because of the skillful purchasing techniques used by P.A. Atkins and his staff, the Material Price Variance Report has actually helped to show how effectively purchasing operates. Last year, for example, actual costs ran 6% below established standard costs. Atkins credits the cost reduction to careful negotiations, use of the learning curve principles, value analysis studies, easing of tolerance requirements, combining vendor runs of similar materials.



MATERIAL PRICE VARIANCE REPORT
MONTH OF FEBRUARY 1959

	Actual Cost	Standard Cost	VARIANCE Amount	Ref	Month	3 Mos.
Purchased Parts						
R210 Sockets	$ 4183	$ 4243	$ 60		1	(4)
R215 sockets	1441	1480	48		3	(9)
R3300 sockets 304 s.s.	8709	9108	399		4	(3)
R25900 sockets	2435	2269	(166)		(7)	(3)
R271 nipples	393	377	(16)		(4)	(1)
R251 nipples	3623	3758	135		4	6
R3900 nipples 304 s.s.	14319	16390	2071	A	13	5
R3900 nipples 416 s.s.	3582	3519	(63)		(2)	(59)
R4900 nipples 304 s.s.	4717	3007	(1710)	B	(57)	(11)
R8903 nippleeq	2105	1804	(301)	C	(17)	23
R9900 nipples 416 s.s.	835	526	(309)	D	(50)	(1130)
R9900 nipples 304 s.s.	123	10	(113)	E	(1130)	(222)
R9900 nipples alum.	297	60	(237)	F	(395)	3
R25900 nipples 416 s.s.	253	2828	294	G	10	28
R818 nuts C1137	302	385	385	H	23	28
R818 nuts 304 s.s.	5				(72)	(86)
R2205 nuts c.s.	17					(13)
R2200 series nuts. c.s.						
R5417 nuts c.s.						
R4200 elbow bodies 304 s.s.						
R4200 elbow bodies 416 s.s.						
R8203 shoulders						
R2299 wire aluminum						
R25900 sleeves						
Reusables						
D3900 sockets c.s.						
D3900 nipples 416 s.s.						
D3900 lockrings c.s.						
Outside Processing						
R3900 sockets 304 s.s. br. ann						
R3900 sockets s.c. cad. plate						
R3900 sockets c.s. heat treat						
R3900 nipples 416 s.c. br. an						
R3900 nipples 304 s.s. br. an						
R9900 nipples 416 s.s. br. a						
R9900 nipples 304 s.s. br. a						
R4200 elbow bodies alu						

Ref:

A Favorable variance due to purchase of 12999 pcs of R3904CC-2 @ $.310, std is $.360 and 19650 pcs of R3906CC-2 @ $.431, std is $.498.

B Purchased 1162 pcs of R4920CC-2 @ $3.36. std is $2.38.

C Unfavorable variance due to the purchase of 1137 pcs of R8903-16 @ $1.75 from N. B. std is $1.56.

D Due to the purchase of 1062 pcs of R9905-2 @ $.540. std is $.428.

E Unfavorable variance due to the purchase of 14 pcs of R9904CC-2 from Precision @ $8.80 std is $.68.

F Purchased 163 pcs of R9904D02 @ $1.82. std is $.37.

G Due to the purchase of 32770 pcs of R818-4 @ $.041, std is $.060, 9984 pcs of R818-6 @ $.065, std is $.075 and 3136 pcs of R818-16 @ $.300, std is $.357.

H Favorable variance due to purchase of 2213 pcs of R818-8C @ $.225, std is $.326.

I Purchased 6471 pcs of R2205-6 @ $.15, std is $.09 and 1232 pcs of R2205-16 @ $.54, std is $.34.

J Due to the purchase of 1264 pcs of R5417-12C @ $1.10, std is $.91.

K Favorable variance due to purchase of 393 pcs of R4900CC-4-45 @ $1.34, std is $1.94 and 582 pcs of R4200CC-8-90 @ $1.69, std is $2.61.

The price variance report shows clearly the actual cost of purchased items as compared with the previously arrived at standard cost. If there is a marked difference between the actual and standard costs, purchasing includes a brief explanation at the end of the report.

"We Welcome the Pressure"

As Atkins puts it: "Frankly we welcome the pressure that is put on us by the variance reports. It makes all of us more cost reduction conscious than ever and it's a good way to let management know what you're doing.

The sooner he is able to adapt or develop systems so that he can treat a maximum number of special items as standards, the better off both he and the company will be.



One of purchasing's regular jobs: preparing the monthly Material Price Variance Report which is sent to all of the company's top executives.

The P.A.'s Legal Responsibility to His Employer

The purchasing agent in his transactions with vendors must maintain unqualified loyalty to his company. An imprudent P.A. must account to his employer any personal profits and benefits obtained through violation of this rule.

By Albert Woodruff Gray

NO RULE OF law has been laid down by the courts with greater emphasis or more hallowed by tradition than the demand for unequivocal loyalty of a purchasing agent to his employer. No man may serve two masters. **Whatever collateral benefits a purchasing agent may gain in the course of his employment are not his but the property of his principal.**

Improvements in the Savannah, Georgia harbor during the early years of the century were carried on under the agency and supervision of an army engineer. In the conduct of this project and the purchase of supplies and services approximately two million dollars was mulcted from government appropriations and divided between this engineer and the general contractor.

In the action brought by the United States for a recovery the court decreed this money to be held by these wrongdoers as a trust of which the government was beneficiary and on the failure of these men to account would be visited the punishments meted out to defaulting trustees.

From that decree an appeal was taken to the United States Supreme Court. There the decree was affirmed, establishing the United States the owner of these sums held by this defaulting engineer and his coconspirator.

Purchasing Agent a Trustee

"If an agent to sell effects a sale to himself under the cover of the name of another person," asserted that court, "he becomes in respect to the property a trustee for the principal and at the election of the latter, sensibly made, will be compelled to surrender to, or if he has disposed of it to a bona fide purchaser, to account not only for its real value but for any profit realized by him on the sale.

"This will be done upon the demand of the principal although it may not appear that the property at the time the agent fraudulently acquired it, was worth more than he paid for it. The law will not in such cases impose upon the principal the burden of proving that he was in fact injured and will only inquire whether the agent has been unfaithful in the discharge of his duty.

"While his agency continues he must act in the matter of such agency solely with reference to the interests of his principal. The law will not permit him without the knowledge or assent of his principal, to occupy a position in which he will be tempted not to do the best he may for his principal."

Then specifically of the wrongdoings of the accused agent against whom this action had been brought, the court added, **"If he takes any gift, gratuity or benefit in violation of his duty or acquires any interest adverse to his principal without a full disclosure, it is a betrayal of his trust and a breach of confidence and he must account to his principal for all he has received.**

"YOUR TROUBLE IS YOU DON'T KNOW WHETHER YOU'RE A BUYER OR A SELLER."



"The agent is not allowed to unite the two opposite characters of buyer and seller because his interests when he is the seller or buyer on his own account are directly conflicting with those of the person on whose account he buys or sells."

"And it is a rule of universal application that no one having such duties to discharge shall be allowed to enter into engagements in which he has or can have a personal interest conflicting or which may possibly conflict with the interest of those he is bound to protect."

As authority the court referred here to a decision it had made over fifty years before in an appeal involving a sale made by the executor of an estate to himself of land in Louisiana. Of such attempts by an agent for his own benefit, the Supreme Court had said in its affirmance of a decree setting aside the sale:

Avoid Conflict of Interest

"The general rule stands upon our great moral obligation to refrain from placing ourselves in relations which ordinarily excite a conflict between self interest and integrity. It restrains all agents, public and private, but the value of the prohibition is most felt and its application is more frequent in the private relations in which the vendor and purchaser may stand towards each other.

"The disability to purchase is a consequence of that relation between them which imposes upon the one the duty to protect the interest of the other, from the faithful discharge of which duty his own personal interest may withdraw him.

"In this conflict of interest the law wisely interposes. It acts, not on the possibility that, in some cases, the sense of that duty may prevail over the motives of self-interest, but it provides against the probability in many cases and the danger in all cases, that the dictates of self interest will exercise a predominant influence and supersede that of duty.

"It therefore prohibits a party from purchasing on his own account that which his duty or trust requires him to sell on account of another and from purchasing on account of another that which he sells on his own account. In effect he is not allowed to unite the two opposite characters of buyers and sellers because his interests when he is the seller or buyer on his own account, are directly conflicting with those of the person on whose account he buys or sells."

The author of an authoritative text book on the law of agency makes the terse comment: **"Where a purchasing agent secures from those with whom his principal dealt, commissions in consideration of buying goods from them, the principal is entitled to recover from the agent the amount of the commissions thus received."** As an authority reference is made here by the author to the decision of an action brought by a city in Ohio against a superintendent of a municipal gas plant, who unbeknown to the city officials, was also a member of a firm manufacturing gas appliances.

Of the conduct of this appliance manufacturer acting in the role of the city's purchasing agent, the federal court said:

"The agency for the city was one which required expert knowledge and involved a considerable degree of trust and confidence. His duty was to give to the public service the full benefit of a disinterested judgment and the utmost fidelity."

Violates Trust

"Any agreement or understanding by which his judgment or duty conflicted with his private interest was corrupting in its tendency. We know of no more pernicious influence than that brought about through a system of commissions paid to public agents engaged in buying public supplies.

"Such arrangements are a fruitful source of public extravagance and speculation. The conflict created between duty and interest is utterly vicious, unspeakably pernicious and an unmixed evil. Justice, morality and public policy unite in condemning such contracts."

To this the court added the comment: "It has its foundation in the very constitution of our nature for it has authoritatively been declared that a man cannot serve two masters. The agent cannot be allowed to put himself in a position in which his interest and his duty will be in conflict."

In Louisiana several years after this decision was rendered, an engineer employed by an oil company secured for his employer a substantial interest in 20 acres of oil land in that state.

Concealed Transaction

Two weeks later he received for himself from the owner by whom this lease to his employer had been made, a quarter interest in the same property. Nothing concerning the transactions of this agent was disclosed by him to his employer.

In his charge to the jury which returned a verdict against this employee the trial judge said of this incident:

"When an agent is shown to have had a series of transactions with another, for his principal, to have during such time accepted a donation from such person with whom he dealt, and to have concealed such donation from his principal, the presumption arises that the donation was made in consideration of the transactions which were had or expected to be made between the agent and the person with relation to the business under the control of the agent, and the agent accepting such donations was bound to account to his principal."

In its approval of the law stated in this charge the Supreme Court of the state in affirming the judgment against the agent, outlined what it termed the gen-

REFERENCES

United States v. Carter, 217 U. S. 286, April 18, 1910

Michaud v. Girod, 45 U. S. 503, January, 1846

City of Findley v. Pertz, 66 Fed. 427, Ohio February 25, 1895

Texana Oil & Refining Co. v. Belchic, 90 So. 522, Louisiana, January 2, 1922

Michigan Crown Fender Co. v. Welch, 178 N.W. 684, Michigan, July 20, 1920

Magidson v. Duggan, 212 Fed. 2d 748, Missouri, May 11, 1954

Trice v. Comstock, 121 Fed. 620, Missouri, March 24, 1903

eral doctrine applicable to circumstances of this character. **"The employee is duty bound not to act in antagonism or opposition to the interest of the employer.**

"Everyone, whether designated agent, trustee, servant or what not, who is under contract or other legal obligation to represent or act for another in any particular business or line of business or for any valuable purpose, must be loyal and faithful to the interest of such other in respect to such business or purpose.

"He cannot serve or acquire any private interest of his own in opposition to it. This is the rule of common sense and honesty as well as of law. **The agent is not entitled to avail himself of any advantage that his position may give him to profit beyond the agreed compensation for his service.**

"He may not speculate for his gain in the subject matter of his employment. He may not use any information that he may have acquired by reason of his employment either for the purpose of acquiring property or doing any other act which is in opposition to his principal's business.

Must Account to Employer

"He will be required to account to his employer for any gift, gratuity or benefit received by him in violation of his duty or any interest acquired adverse to his principal without full disclosure, though it does not appear that the principal has suffered any actual loss by fraud or otherwise."

Few if any rules of law however, are without their exceptions. By a Michigan corporation, engaged in the manufacture of sheet metal parts for automobiles a production engineer was employed as general manager. While so employed and engaged in negotiations for the purchase of steel for this company he purchased and sold for his own account a quantity of the same type of steel at a profit of over $5,000.

He refused to disclose to the others of his company the details of the transaction, with the comment that he would be the judge of any conflicting interests.

In its review of the case and sustaining a decision by the lower court against this agent, the appellate court of that state said of this rule that individual transactions by an agent in his principal's business must be with the knowledge and assent of the employer.

"Independent of the express terms of his hiring not to engage in other business, **it is an elementary rule of agency that his duties required his efforts and activities in the line of his employment should be for the benefit of his principal.** He was not at liberty to deal in the business of his agency for his own benefit.

"It was his duty to communicate to his principal facts relating to the business which ought in good faith to be made known to the latter."

A further exception to this rule denying a purchasing agent a right to benefits from his relation to his employer's suppliers, was outlined only a few months ago by a federal court.

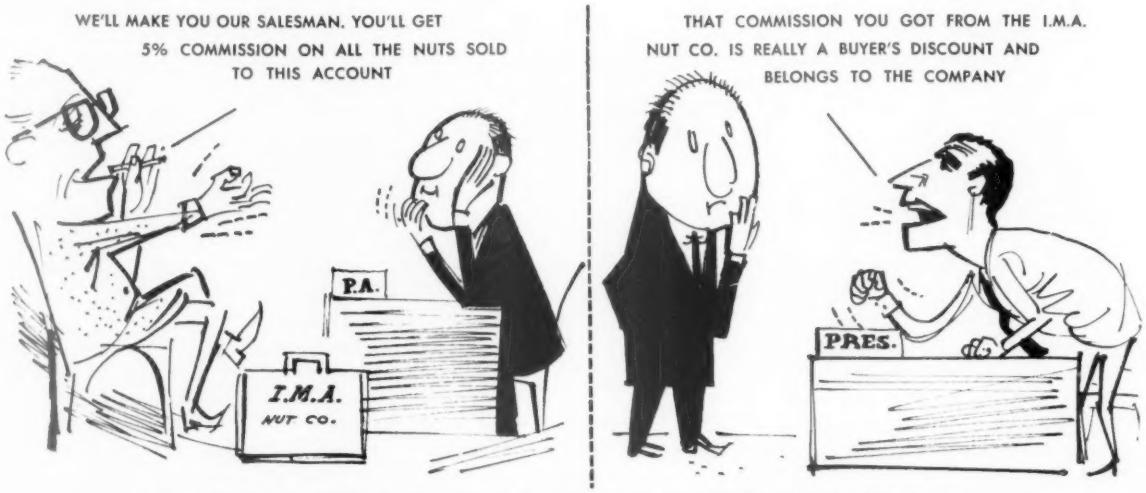
Unrelated Activities

"One in a position of trust who does for himself what he is obligated to do for his beneficiary may not retain the fruits of his derelictions. **But the private and personal activities of a fiduciary are not limited unless they are directly related to those of his principal."**

In a decision many years ago by a federal appellate court of a controversy over circumstances of this sort in Missouri is set out the duties of a purchasing agent that by tradition and the recurring approval of the courts, has taken on the character of a commandment.

"For reasons of public policy founded in a profound knowledge of the human intellect and of the motives that inspire the actions of man, the law peremptorily for-

(*Please turn to page* 190)



"Where a purchasing agent secures from those with whom his principal dealt, commissions in consideration of buying goods from them, the principal is entitled to recover from the agent the amount of the commissions thus received."

The Olin Aluminum representative shows a customer how to ELIMINATE FAILURES ON THE FORMING LINE



PROBLEM: Customer was unable to send coil stock through progressive dies of a punch press without frequent instances of cracking and improper forming. Tried several brands of aluminum with sporadic success at best.

SOLUTION: The man from Olin Aluminum did a quick sleuthing job and decided that the press was improperly adjusted. He raised the ram several thousandths of an inch . . . increased the length of the slug removers on all punches . . . arranged to have the working area blown out every time the coil changed, for better house cleaning.

RESULT: Aluminum coil ran so successfully that the customer requested the Olin Aluminum representative to stop by to discuss speeding up the machine. Consequently, **the production rate was increased 20%. Added result:** Another steady customer for Olin Aluminum—today's fast-moving, machineable metal.

You, too, can always look to the Olin Aluminum representative for heads-up thinking. Furthermore, his keen insight into your problems is backed up by the Olin Aluminum Technical Advisory Service. Why not consider Olin Aluminum **your** personal storehouse of profit-building ideas.

SEE EDWARD R MURROW ON "SMALL WORLD"—EVERY SUNDAY EVENING, CBS-TV

OLIN ALUMINUM

OLIN MATHIESON • METALS DIVISION • 400 PARK AVENUE • NEW YORK 22, N. Y.

For More Information Write No. 207 on Inquiry Card—Page 32

New Synthetic Does Jobs No Other Rubber Material Will Do



Some typical applications of the new heat resistant rubber, Viton.

BOTH literally and figuratively, the hottest development in synthetic rubber today is a new fluorocarbon elastomer. Called Viton by its manufacturer, DuPont, the new material can be used safely at temperatures well over 400° F. And it holds its physical properties in this extreme heat despite the presence of oxidizing acids, hydraulic fluids, lubricants, aromatic fuels and organic liquids.

When one considers that the useful properties of rubbers are destroyed by most of these fluids and that, with the exception of Silicone, no rubber can be used in this temperature range, it is not hard to forecast many applications for this new material.

This article was prepared by Stanley Kogut, president, Mechanical Rubber Products Co., Warwick, N.Y.

In addition to its usefulness in heat and fluids, Viton has excellent aging and weathering characteristics which include remarkable retention of properties in ozone, sun and light which to varying degrees are harmful to most rubber.

Its dielectric properties are similar to that of most other rubber materials, running between 40 and 600 volts per mil. It has flame resistant and fireproofing qualities as well as satisfactory low temperature characteristics.

Its useful cold range is around minus 25° F. and its brittle point is minus 47° F. Viton has good abrasion resistance and can be bonded to metals. In conventional compression set testing at 75 per cent of its original thickness for seventy hours at 250 degrees, it recovered 93% which is quite satisfactory.

TYPICAL USES OF VITON

APPLICATION	USE
Appliance seals (washer-dryer)	Detergent solutions, hot air at 300°F.
Calender rolls	Hot Plastic Sheeting
Carburetor U-cups	High aromatics content gasoline
Centrifuge O-Rings	Chlorinated hydrocarbons including methylene chloride
Coated asbestos fabric for aircraft firewalls	Aviation fuel, hydraulic oils
Fuel line hose connector	Aviation fuel
Gasoline pump O-Rings	High aromatics content gasoline
Heat exchange O-rings	Fatty acids at 525°F
Missile components O-Rings	Hydraulic oils, missile fuels
Oil well packer seals	Crude oil, drilling mud at 6000 psi. and 300°F.
Pipe gaskets	High pressure steam
Pump diaphragms	Concentrated sulfuric acid
Pump liners	Concentrated hydrochloric acid
Safety suits	TEL and missile fuel handling
Valve stem seals	Hot automotive lubricants

Versatile Material

Viton is processed by rubber manufacturers on conventional equipment. It can be molded, extruded, compounded with other materials such as cork, paper and asbestos, blown into sponge, painted or sprayed as a latex and combined with fabric.

While Viton is extremely expensive in a raw state, the cost of the raw material very often represents a small percentage of the cost of the finished product you may be buying or selling. Labor, overhead and other costs are the same as for any other type of rubber material and the actual total dollar cost difference between Viton and less expensive rubber materials may be small. Viton will often be cheaper if the cost of replacing a rubber part in an operating unit is considered. With its heat and fluid resistant qualities, Viton can be used for entirely new applications in pumps, heat exchangers and boilers that might have otherwise been unsuitable for operation.

For applications where its unique properties permit the operation of a device in an area where it was hitherto restricted, there should be no resistance to the Viton's higher cost. Viton parts can be offered as extra charge options for use in those

special areas where it might be required. In applications that permit it, the same contrivance can be furnished with conventional rubber materials at the lower price.

Need Fewer Replacements

Viton can be used as linings in tanks, pumps, hoses, pipes and other units carrying or transporting fluids that destroy other types of rubber. In many instances these linings can be brushed or sprayed on without the use of special tools. The heat from motors combined with oils and greases that are often present cause premature failure of rubber parts. The use of Viton would reduce replacments considerably. Also, high octane gases and highly aromatic fluids generally can be used with Viton with a much higher life expectancy than the other rubbers can be.

Heat Resistance: Viton's resistance to heat is its prime advantage. Recommended heat-time service is:

50 hours at 600° F.
1000 hours at 500° F.
3000 hours at 450° F.

The presence of corrosive fluids will tend to reduce somewhat the number of useful hours and the lack of them increase it. Intermittent service will increase the useful number of hours broadly. The shorter the heat cycle, the longer the life of the part.

Physical Properties: At room temperatures, Viton's properties very closely resemble those of medium firm rubbers. It cannot be made into a soft material with a low durometer range.

Durometer	60 to 90
Tensile	2000 to 3000 p.s.i.
Elongation	100 to 2400
Compression Set	90% to 97%

Fluid Resistance: Viton without question has better fluid resistance than any other rubber materials. The accompanying chart shows the most commonly used fluids in which it works satisfactorily. However, Viton should not be used with low molecular weight esters and ethers, ketones, certain amines, hot anhydrous hydrofluoric or chlorosulfonic acids and some proprietary fluids such as Skydrol 500.

FLUID RESISTANCES OF TYPICAL VITON COMPOUNDS

EXCELLENT

Fluid	Temp. °F	Days Exp.	% Swell
ASTM No. 1 Oil	300	7	0.5
ASTM No. 3 Oil	300	7	4.2
Carbon Disulfide	75	28	2.0
Cod Liver Oil	75	7	4.0
Cyclohexane	75	7	4.0
Ethyl Alcohol	75	7	1.7
Ethylene Glycol	212	14	1.1
Hydrofluoric Acid, 48%	75	7	4.8
JP-4 Fuel	75	7	0.8
JP-5 Fuel	75	7	0.4
Kerosene	300	7	0.1
MIL-O-5606 Tricresyl Phosphate Modified Petroleum Oil	275	7	2.6
MLO-8200 Silicate-Ester Hydraulic Fluid	300	7	1.8
Naphtha	158	28	7.4
Perchloroethylene	212	28	11.0
Petroleum Oil, Crude	300	7	1.4
Phosphoric Acid, 60%	212	28	4.2
Ref. Fuel B (70% Isooctane, 30% Toluene)	75	7	2.5
Sodium Hypochlorite, 20%	158	7	8.1
Sulfuric Acid, 60%	250	28	10.1

VERY GOOD

Ammonium Hydroxide	75	28	7.5
Benzene	75	7	20.0
Carbon Tetrachloride	158	7	12.0
Chlorine Gas, Dry	212	5	(1.4% wt. Incr.)
Cottonseed Oil	300	28	1.5
Creosote Oil	212	7	9.5
Cresylic Acid, 100%	212	28	11.0
o-Dichlorobenzene	300	7	24.0
Dowtherm A	400	7	18.0
GL-90 Lubricant	300	21	11.0
Hydrochloric Acid, 37% (special acid resistant Cmpd.)	158	7	1.0
MLO-8515 Silicate-Ester Hydraulic Fluid	400	3	4.0
Monochlorobenzene	75	30	10.0
Nitric Acid, 60%	75	7	24.5
Nitric Acid, red fuming (special acid resistant Cmpd.)	75	7	16.0
Steam	400	7	4.0
Sulfuric Acid, 95%	158	5	4.5
Transmission Fluid Type A	212	7	1.5
Trichloroethylene	158	7	15.5
Triethylborane	160	30	5.0
Turpentine	158	28	9.0
Xylene	158	28	18.0

GOOD

Cresylic Acid, 100%	300	28	25	
Dowtherm A	400	28	23	
Ethylene Dichloride	75	3	11	
Hydrofluoric Acid, 75%	212	5	34	
Kerosene	300	28	20	(excellent after 7 days)
Methylene Chloride	75	7	30	
MIL-L-7808 Diester Lubricant	400	28	21	
Oleum, 20%	75	7	5	
OS-45 Silicate-Ester Hydraulic Fluid	400	7	11	
Phenol	300	28	24	
Pickling Solution (15% HNO_3, 4% HF)	158	7	19	(unsatisfactory after 28 days)
Sodium Hydroxide, 50%	158	7	30	
Sulfuric Acid, 95%	250	5	42	
Toluene	75	3	8	

ADEQUATE FOR ONLY LIMITED SERVICE

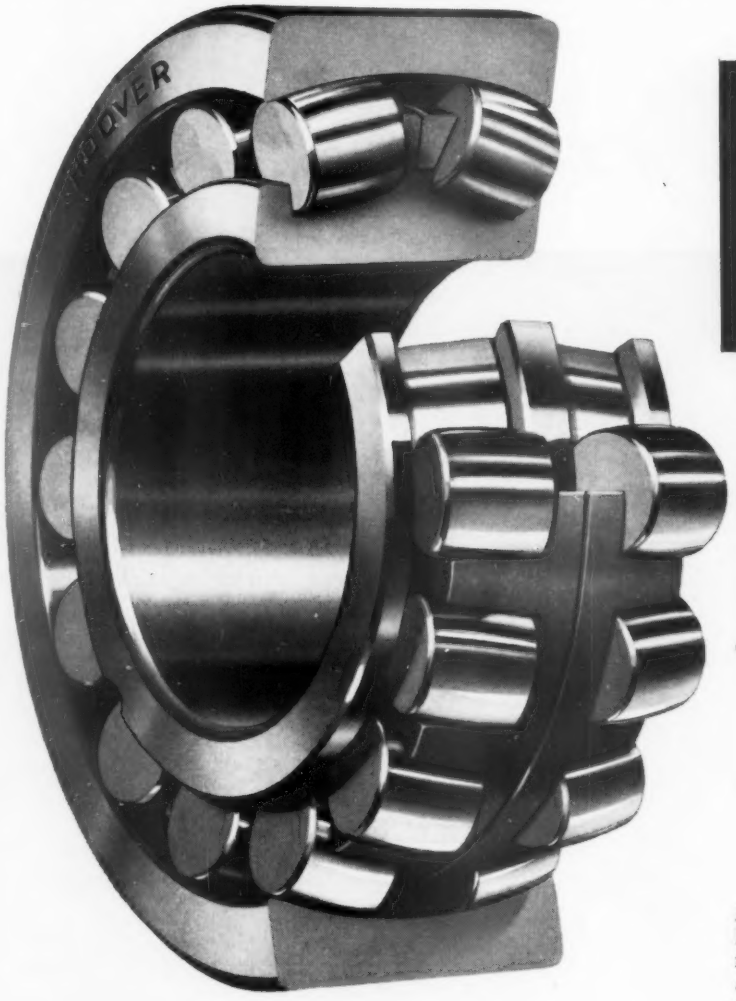
Acrylonitrile	122	7	115
Aniline	158	28	26
Butyric Acid	212	7	35
Epichlorohydrin	122	7	94
Freon-12	300	7	20
Freon-22	175	30	90
Methanol	122	3	88
Nitrobenzene	158	7	66
Trichloroethane	158	7	40

UNSATISFACTORY

Acetic Acid, glacial	75	7	62
Acetone	75	7	271
Amyl Acetate	75	7	410
Aniline	300	7	–
Dimethyl Formamide	75	7	260
Ethyl Acetate	75	1	425
Ethyl Acrylate	75	7	234
Liquid Ammonia	75	1	–
Methylethyl Ketone	75	7	317
Pyridine	75	3	118
Skydrol 500	300	7	270

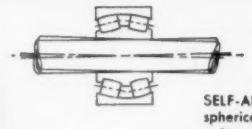
Now! *Hoover Quality*

HOOVER *super finish* RACEWAYS AND ROLLERS

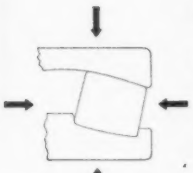


SPHERICAL Roller Bearings

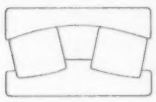
Complete Range of Series and Sizes



SELF-ALIGNING—Hoover spherical roller bearings automatically compensate for shaft misalignment in any direction, either initially or dynamically under load.



RADIAL OR THRUST LOADS—Double row of large-size rollers provides capacity for heavy radial and shock loads. High contact angle provides substantial thrust loads in either direction.



ACCURATE ROLLER GUIDANCE is assured by heavy center flange guide, asymmetrical roller design and heavy machined bronze, land-riding retainers.

Hoover Quality spherical roller bearings have two rows of large-size convex rollers to provide exceptional radial and shock load capacity. In addition to the important features illustrated above, Hoover spherical roller bearings utilize a land-riding, machined solid bronze retainer capable of withstanding high stress. Hoover roller guidance features, plus precision matching of *Super Finish* rollers and raceways, assure uniform load distribution, low operating temperatures and enduring performance. Available in a complete range of series and sizes—with cylindrical or tapered bore.

HOOVER BALL AND BEARING COMPANY PM-12
5400 South State Road, Ann Arbor, Michigan

Please send information about the roller bearings checked:

☐ Have your representative call.

☐ Spherical roller bearings ... Bulletin No. 113

☐ Cylindrical roller bearings ... Bulletin No. 114

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

In Roller Bearings

ASSURE EXTRA LONG LIFE . . . SUPERIOR PERFORMANCE

Depend on Hoover to set new high standards for roller bearing quality . . . *Hoover Quality!*

In roller bearings, *Hoover Quality* means that raceways and rollers are *Super Finished* to gleaming, mirror-like smoothness. It is this *Super Finish* that results in longer bearing life and superior performance.

Hoover enters the roller bearing field with complete lines of the most widely used of spherical and cylindrical types. Hoover roller bearings are accurately made of the finest of materials. They utilize the most successful of operating and design features. They assure you the best in roller bearing performance for a wide range of applications.

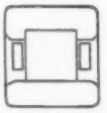
CYLINDRICAL Roller Bearings

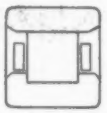
Complete Range of Series and Sizes

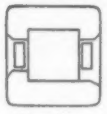


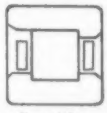
Hoover Quality cylindrical roller bearings are designed with crowned rollers that provide uniform load distribution for maximum radial load capacity and minimum friction. Because they are cool running, high speed operation under heavy radial loads is possible.

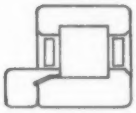
Rollers and raceways are *Super Finished* to mirror-like smoothness for quiet operation and long life. Retainers are machined solid bronze assuring strength and accurate roller guidance. Available in a complete range of series and sizes in the types pictured at right.


Type NU—Straight inner race


Type N—Straight outer race


Type NJ—Single flanged inner race


Type NF—Single flanged outer race


Type NH—Single flanged inner race with stabilizing ring

hoover

BALL AND BEARING COMPANY

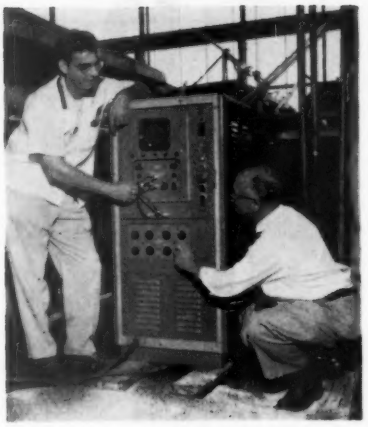
5400 South State Road, Ann Arbor, Michigan

Zone Sales Offices and Warehouses

8581 South Chicago, Chicago 17, Illinois
290 Lodi Street, Hackensack, New Jersey
2020 South Figueroa, Los Angeles 7, California

For More Information Write No. 208 on Inquiry Card—Page 32

Sound Energy Checks Steel Quality at Production Line Speed



Control console houses ultrasonic Reflectoscope and amplifying and display system. Signal from flaw detector is made visible on cathode ray scope and actuates marking device. Spray gun mounting is in background.

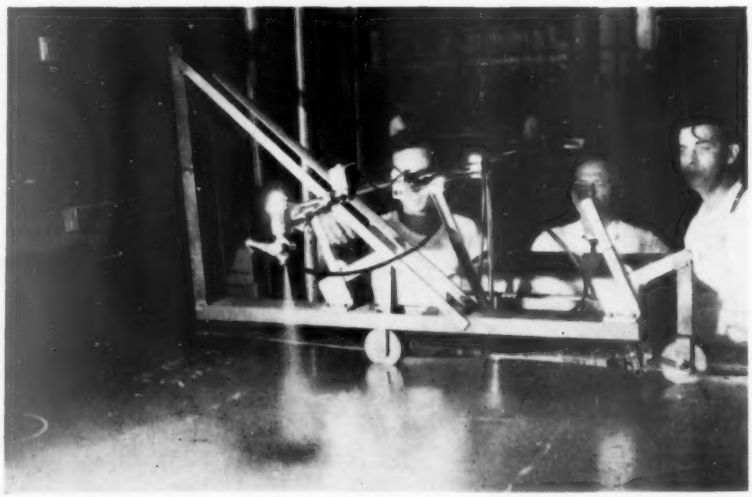
HIGH-SPEED in-process quality control of steel sheets is made possible by an ultrasonic flaw detecting method developed jointly by Sperry Products, Inc. and Chrysler Corp. Using a Reflectoscope, the inspection system continuously checks sheets of steel unwinding at a speed of 200 feet per minute.

Capable of detecting laminations one inch long or more in sheets moving at speeds up to 400 feet per minute, the system saves money because faulty materials are not processed past the inspection stage. Sperry Products also makes automated ultrasonic equipment for testing welded tubing, billets, rounds, atomic fuel rods, and other metal forms. The company is now developing a method that would accept or reject 300 spot welds every four and a half seconds.

In the Chrysler installation, the ultrasonic equipment is placed between the unwinding coil of steel and the blanking machine which cuts the sheet to size. The inspection unit searches out laminations and sprays the faulty part with a bright colored dye. After blanking, marked sheets are removed from the line and scrapped or downgraded for other uses. The system can be placed anywhere in the production line, thereby eliminating the need for special inspection areas, immersion tanks, and handling equipment.

Ultrasonic testing may use frequencies from 50 kilocycles to 200 megacycles. This equipment operates at a frequency of one megacycle. Packets of high-frequency energy are sent into the material at regular intervals and the echoes or signals returned from discontinuities in the material are observed on a cathode ray tube. The amplifier and display system which receives the returning signal prepares it for visual observation and actuates a control which may sound an alarm, mark the defective material, or stop the machine.

Since air will not transmit the high frequency sound energies used in ultrasonic testing, a couplant such as oil, water, or glycerine is needed between the signal source and workpiece. To assure uniform coupling between the two, the flow of the liquid is carefully controlled by a recirculating pump.

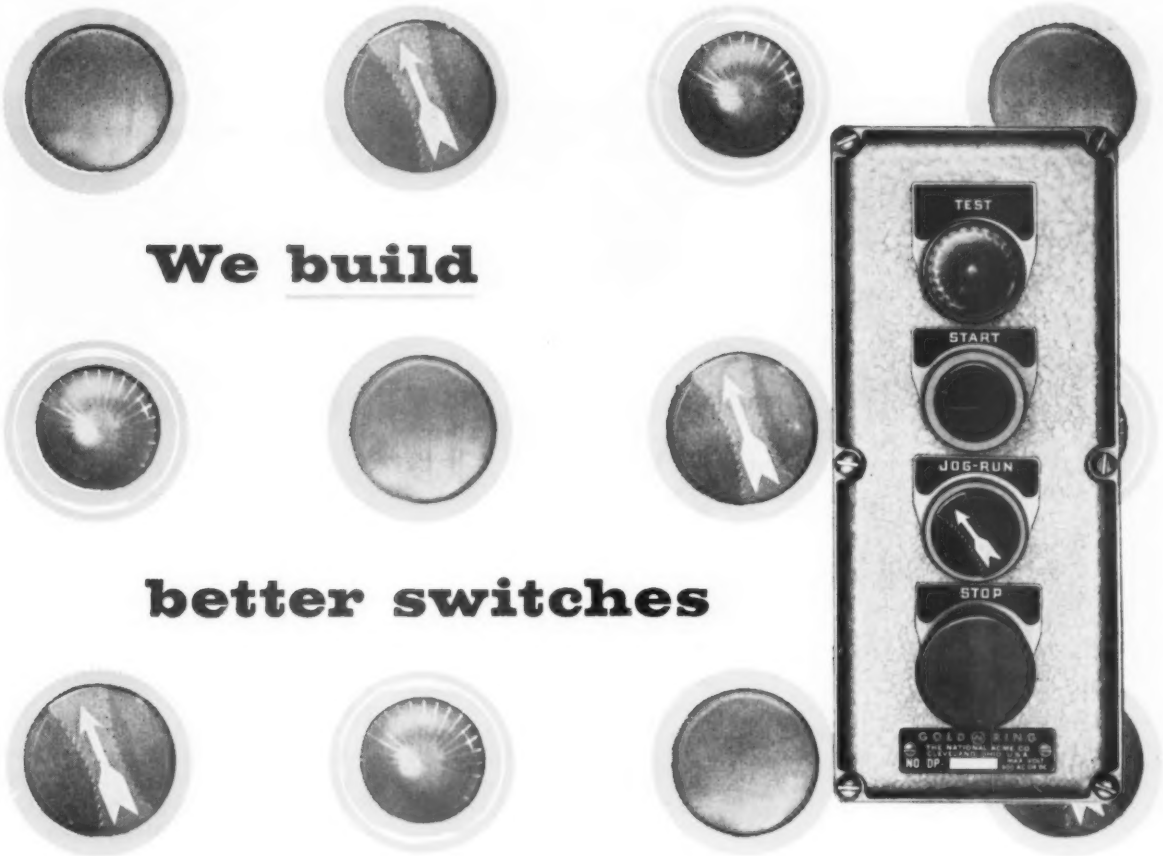


Paint spray gun in operation. Bright color clearly marks imperfect material.

Unit is Portable

Although elaborate testing systems have to be tailored to the needs of the individual user, the company also has developed a portable Reflectoscope which can be used as the basis of a flexible ultrasonic flaw detection system. Compact design—combined with plug-in units—permits selection of components necessary for a particular testing job and provides a means for adding instrumentation to meet expanding or changing testing requirements.

Sperry Products also manufactures a portable ultrasonic thickness gage which can be used to measure thickness and inspect corrosion in pipes, storage vessels, and ships' hulls.



We build better switches because we can't buy them

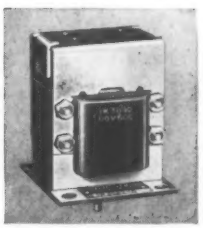
...IT'S AS SIMPLE AS THAT...AND THEY COST NO MORE THAN OTHER SWITCHES

We had to build Gold-N-Ring Control Switches to meet our own high reliability specifications . . . our reputation was a part of this important fact. We're machine tool builders. We can't afford to be responsible for costly down-time on important capital investment equipment due to inferior control switches. That's why we build them like precise machine tools . . . and why it will pay you to check with us.

A wide range of basic units meets practically every need . . . as well as completely assembled stations in 1 to 4 button sizes to meet your electrical specifications. Ask our representative to call, or send for Bulletin ECS-56 . . . the complete selection and ordering guide.



LIMIT SWITCHES. A full line, originally designed for machine tool applications but now used wherever the highest reliability factors are required. Bulletin EM-51.



SOLENOIDS. A full line of standard and custom units for AC or DC. Push or pull types with capacities up to 25 lbs. Bulletin EM-52A.

ELECTRICAL MANUFACTURING DIVISION

National Acme

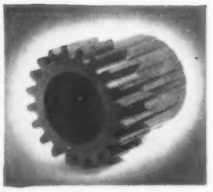
THE NATIONAL ACME COMPANY
191 E. 131st STREET
CLEVELAND 8, OHIO

For More Information Write No. 209 on Inquiry Card—Page 32

No one wants to hear the gears turning!



A TAYLOR laminated plastic gear is noiseless, acts as a safety valve in a gear train



You can solve two problems with a single gear made from TAYLOR laminated plastic silent gear stock. Noise of meshing gears can be eliminated. Damage due to destructive overloads can be localized to protect the rest of the gear train and equipment. And the laminated plastic gear will outwear metal under normal operating conditions. Look into the physical and mechanical properties of TAYLOR laminated plastic silent gear stock. It is adaptable to a wide variety of applications. Write TAYLOR FIBRE CO., Norristown 36, Pa.

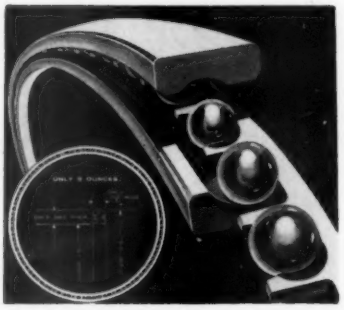
Taylor

LAMINATED PLASTICS VULCANIZED FIBRE

For More Information Write No. 210 on Inquiry Card—Page 32

Products

New Thin Section Bearing Line



A new thin section bearing line includes 90 sizes with bores from 4 to 12 in. Economical, lightweight bearings have deep-groove ball radial construction and a new one-piece bronze snap-over separator. Sizes range from ¼ to 1 in. width and cross section. High carbon chromium bearing steel is used for the bearing races, with other metals available for special orders. Many sizes have only 34% of the width and cross section and less than 15% of the weight of comparable bearings. **Kaydon Engineering Corp., McCracken St., Muskegon, Mich.**

Write No. 18 on Inquiry Card—Page 32

New Toolholder for Carbide Inserts



A new toolholder for disposable carbide inserts features an indexing, fully adjustable chip-breaker of solid carbide. Toolholder provides positive setting of the chip-breaker and infinite adjustment within its range. Full-floating double-edged chip-breaker and clamp are held in exact alignment by keys and key slots. Five styles in both left and right hand models are available in three different sizes. **Metallurgical Products Dept., General Electric Co., 11177 E. Eight Mile Rd., Detroit 32, Mich.**

Write No. 19 on Inquiry Card—Page 32

US RUBBER MATCHLESS STEAM HOSE



How to stay alive working next to live steam

Steam—indispensable workhorse in an industrial plant. But if it breaks loose, steam may cause death on contact. Yet this man works with complete security—literally within an inch of his life—because he's working next to the hose that steam cannot burst: wire-braided U.S. Matchless® Steam.

This hose gives ample notice when replacement is needed. Even after long, hard service (and with 200 pound steam pressure) the safety-sure wire-braid construction of U.S. Matchless prevents it from bursting. Instead, just a wisp of steam is allowed to seep through. This acts as a safety device, telling you that replacement is needed. That's why plant safety councils all over the country find no match for U. S. Matchless.

Despite its great ruggedness, this hose is flexible, lightweight, easy to handle.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

Mechanical Goods Division

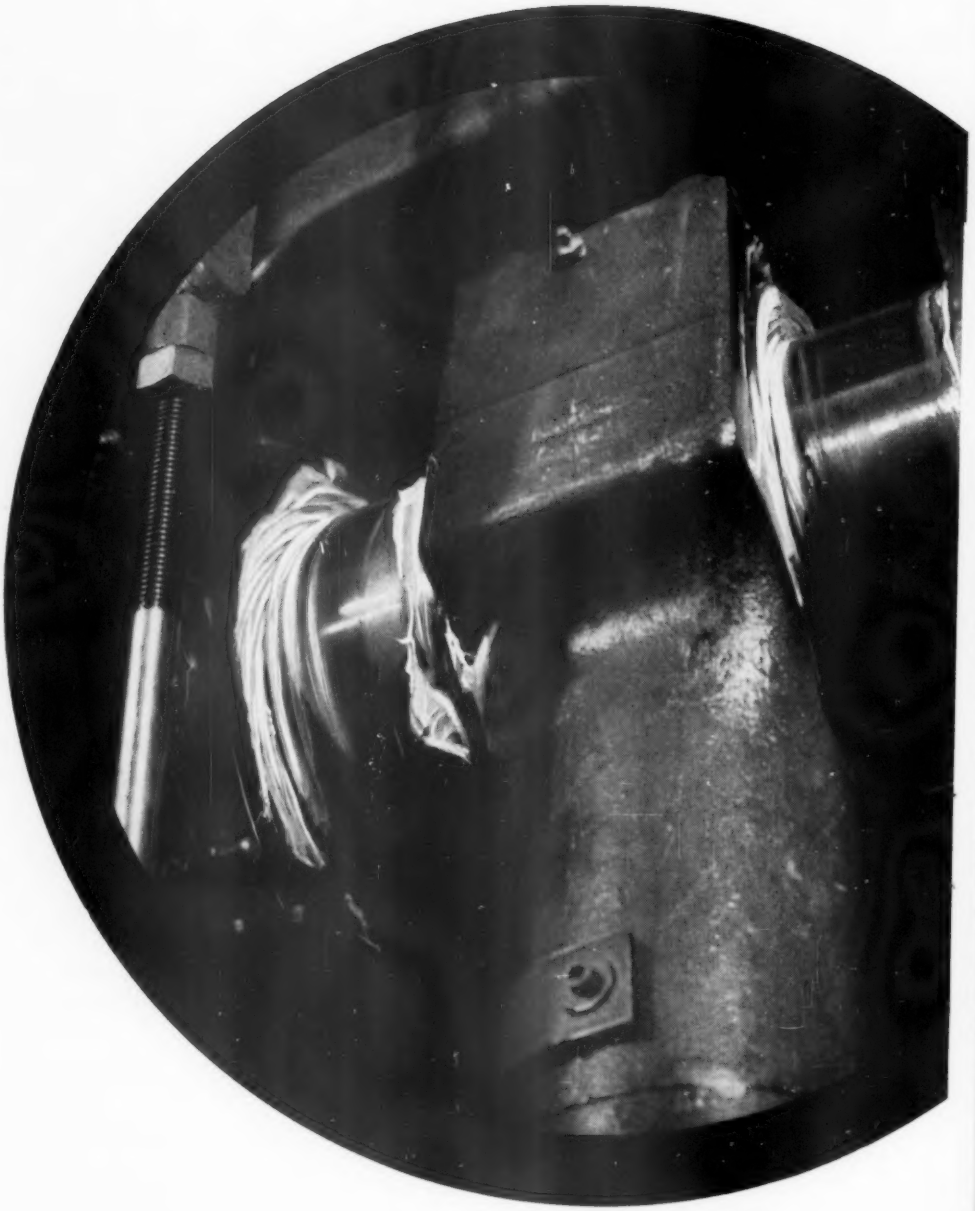
US RUBBER **United States Rubber**

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

For More Information Write No. 211 on Inquiry Card—Page 32

Mobilplex ep



The Multi-Service Grease with unique Calcium EP Complex. Never before in a single lubricant such a wide range of use . . . such a margin of superiority . . . such a potential for maintenance savings.



Above: Mobilplex EP produces excellent results in Timken OK-Load tests, provides outstanding performance in heavy-duty equipment.

Heavy- or shock-loaded bearings like these grease-lubricated mechanical press bearings last longer, require less maintenance with Mobilplex EP.

Outstanding load-carrying ability is one of the many important properties of Mobil's new Multi-Service Grease —*Mobilplex EP*. In your manufacturing plant you'll find it provides maximum protection against wear under heavy and shock loads. Mobilplex EP also offers excellent resistance to heat, and extra protection against soluble oil emulsions and corrosion. It is a singularly tenacious and adhesive lubricant.

This Multi-Service grease has outstanding oxidation resistance as well as excellent structural and storage stability. These qualities—plus the great versatility of Mobilplex EP—make it useful throughout the plant.

Plant operators throughout the country are finding Mobilplex EP extremely effective in extending bearing life and protecting production schedules. In addition, they're saving more than with ordinary multi-purpose greases because Mobilplex EP makes it possible to reduce application frequency, simplify storage and handling procedures.

Contact your Mobil representative for full details. He can show you results of laboratory performance tests of Mobilplex EP and five leading competitive extreme-pressure greases. You'll see why Mobilplex EP is rated tops!

MOBIL OIL COMPANY, A Division of Socony Mobil Oil Company, Inc.

MULTI-SERVICE ABILITY OF MOBILPLEX EP

ANTI-FRICTION BEARINGS  (*horizontal and vertical*). Temperatures in the range of 300 F. Heavy or shock loads. Water contamination. Speeds—low, normal, high.

PLAIN BEARINGS  All normal mechanical and operating conditions. Temperatures in the range of 300 F. Waterwash. Heavy or shock loads.

DISPENSING AND APPLICATION DEVICES 
Transfer pumps. Hand and power guns (*long lines*). Central greasing systems.

Mobil



There's Special

SALES APPEAL
with
CLEVELAND C-THRU CONTAINERS

....and they combine 5 important packaging advantages:

★ DISPLAY AND PROTECT
★ ELIMINATE DOUBLE LABELING
★ INCREASE PACKAGE STRENGTH
★ ADD EXCITEMENT TO PRODUCT
★ CREATE NEW SALES POWER

The Mark Allen Company, makers of "Vogue House Cologne," is one of the manufacturers in the cosmetic and drug industry to profit from the new outstanding advantages of C-THRU containers. Constructed of clear spirally-wound plastic, they are available in diameters from 5/8", in lengths as required. Choice of gaily colored bands may be imprinted if desired. Closures and plugs in full range of types and sizes in paper, plastic, and metal. The container illustrated features a top and bottom of curled and disced paper.

Ask our Engineering Department to explain how a C-THRU container can be designed for your product.

THE
CLEVELAND CONTAINER
COMPANY

Plants and Sales Offices: Cleveland, Detroit, Chicago, Memphis, Los Angeles, Plymouth, Wis., Jamesburg, N. J., Fair Lawn, N. J.

6201 BARBERTON AVE. • CLEVELAND 2, OHIO

ALL-FIBRE CANS • COMBINATION METAL AND PAPER CANS
SPIRALLY WOUND TUBES AND CORES FOR ALL PURPOSES

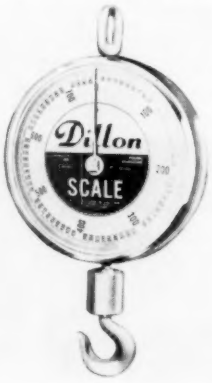
CLEVELAND CONTAINER CANADA, LIMITED
Plants & Sales Offices: Toronto & Prescott, Ont. • Sales Office: Montreal

Sales Offices: New York City, Washington, D.C., Rochester, N. Y., West Hartford, Conn.
•
Abrasive Division at Cleveland

For More Information Write No. 213 on Inquiry Card—Page 32

Products

New Automatic Suspension Scale



A new automatic suspension scale for industrial application features accuracy of 1/10 of 1% and is officially sealed by the Bureau of Weights and Measures prior to shipment. Unit is available in following capacities: 0-250, 0-500, 0-750, 0-1000, 0-5000, 0-7500 and 0-10,000 lbs. Ball bearing swivel book revolves freely under maximum load a full 360 degrees in either direction and will arc 27 degrees. Convenient adjustment knob permits easy cancelling out of weight of slings, chains or pallets. **W. C. Dillon & Co., Inc., 14620 Keswick St., Van Nuys, Calif.**

Write No. 20 on Inquiry Card—Page 32

New Low-Cost Safety Lamp



A new explosion-resistant safety lamp is low in cost. Originally designed for potentially explosive areas of the aircraft industry, small and lightweight unit is ideal for inspection applications

(*Please turn to page* 110)



By switching to Scott Towels, Mr. Cox eliminated Bell's towel laundering charge and greatly reduced janitorial expense.



Chief Purchasing Agent Donald Wilson, left, discusses inventory with Robert M. Cox, Supervisor of Buildings and Grounds. Quantity purchases of Scott Towels also contribute to Bell's annual savings.



Bell has 2500 employees, provides them with Scott UHA Towels (Ultra High Absorbency) in all 29 washrooms.

Bell Helicopter Corporation buys Scott Towels because:

"Scott Towels saved Bell $12,000 the first year they were used!"

Among the total expenses of a large manufacturing plant, the cost of washroom maintenance and supplies may often seem insignificant. Yet here is an area where *value analysis* has frequently led to impressive savings. Bell Helicopter Corporation is a case in point. Mr. Cox analyzed his cost figures, then switched from cloth roll towels to individual Scott Towels. By so doing, savings in the first year alone averaged $1,000 a month.

For free washroom cost *value analysis* form, contact your Scott distributor. He's listed in the Yellow Pages under "Paper Towels."

SCOTT PAPER

Scott UHA Towels
Scott Multifold Towels
Scott Singlefold Towels
ScotTissue

Distributed through the leading paper merchants of America

For More Information Write No. 214 on Inquiry Card—Page 32

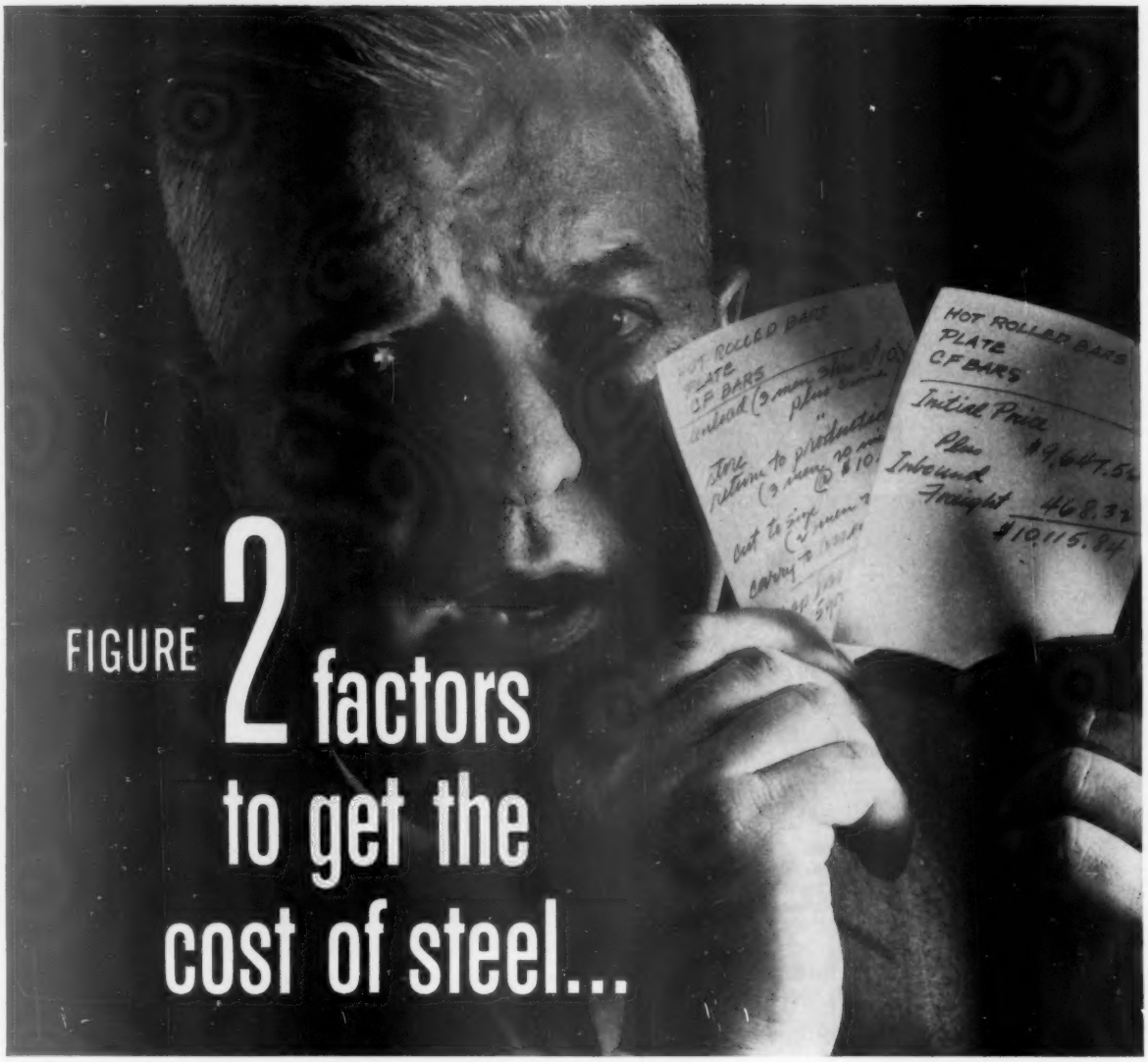


FIGURE 2 factors to get the cost of steel...

Initial price! And COST OF POSSESSION!

If you're putting steel in inventory for later use because you think it's a bargain, compare all your costs, including cost of possession, with the price and *freedom from risk* of buying from your Steel Service Center.

Many steel users have found that using Service Center steel saves expensive storage space and saves the costs of obsolescence, waste, handling and cutting.

When you use Steel Service Center labor and equipment for preliminary processing, you save both the investment and operating expense of having your own labor and equipment.

Use the chart to figure all your costs. For more information, get the booklet, *What's Your Real Cost of Possession for Steel?* Ask your nearby Steel Service Center. Or write to Steel Service Center Institute, Inc., 540-E Terminal Tower, Cleveland 13, Ohio.

COST OF POSSESSION FOR STEEL IN YOUR INVENTORY

Per ton delivered	_____
Cost of capital:	
Inventory	_____
Space	_____
Equipment	_____
Cost of operation:	
Space	_____
Materials handling	_____
Cutting & burning	_____
Scrap & wastage	_____
Other costs:	
Obsolescence	_____
Insurance	_____
Taxes	_____
Accounting	_____
TOTAL	_____

COST OF FREEDOM-FROM-RISK STEEL FROM YOUR STEEL SERVICE CENTER

Per ton, cut-to-size, and delivered

TOTAL _____

STEEL SERVICE CENTER INSTITUTE

...YOUR STEEL SERVICE CENTER

For More Information Write No. 215 on Inquiry Card—Page 32



EASIER THAN PEELING A BANANA!

New Cross-ett-Zip Leatherneck Kraft



Now you can get famous Leatherneck wrapping kraft in this easy-to-remove protective cover.

No more tearing or cutting. No more wasted top layers of paper. The built-in tear strip peels off the over-wrap. Clean, usable paper unwinds from the first inch of the roll. You save time and stop waste; eliminate a source of cut, sore fingers.

The Leatherneck trade-mark on the wrapper and on the core is your assurance of product quality consistent with the Crossett reputation for dependability.

Call your Crossett merchant today and place an order for Leatherneck in the new Cross-ett-Zip covering.



CROSSETT PAPER MILLS

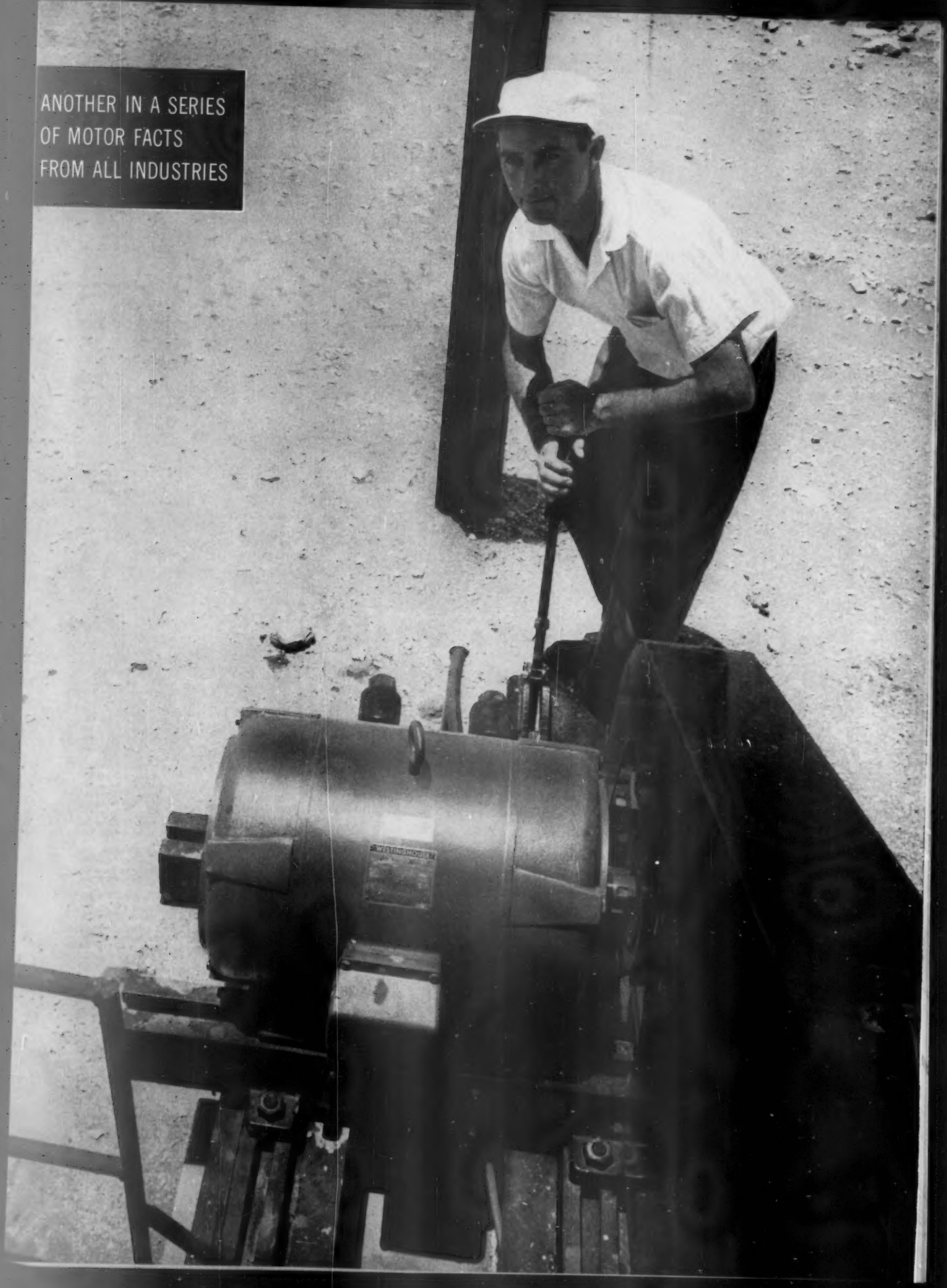
A Division of The Crossett Company, Crossett, Arkansas



AUTHORIZED DISTRIBUTORS

ABILENE, TEX. — Lind Paper Co.
ALEXANDRIA, LA. — Bancroft Paper Co
Louisiana Paper Co.
APPLETON, WISC. — Universal Paper Co.
ATLANTA, GA. — Dillard Paper Co.
AUGUSTA, ME.
Carter-Rice-Storrs & Bement, Inc.
AUSTIN, TEX. — Lone Star Paper Co.
BALTIMORE, MD. — Hubbs & Corning Co.
BATON ROUGE, LA. — Bancroft Paper Co.
Louisiana Paper Co.
BIRMINGHAM, ALA. — Dillard Paper Co.
E. F. Osment Paper Co.
BOSTON, MASS.
Carter-Rice-Storrs & Bement, Inc.
BROOKLYN, N. Y. — Royce Paper Co.
BUFFALO, N. Y. — Hubbs & Howe Co.
CHICAGO, ILL. — Abana Products, Inc.
Berkshire Papers, Inc.
Bermingham & Prosser Co.
Chicago Paper Co.
Inlander-Steindler Paper Co.
Kraft Paper Sales Co.
Montrose Paper Mills
Pilcher-Hamilton Co.
CINCINNATI, O. — Anchor Paper Co.
Chatfield Paper Co.
Cinti. Cordage & Paper Co.
Diem & Wing Paper Co.
Merchants Paper Co.
Seinsheimer Paper Corp.
CLEVELAND, O. — Alling & Cory Co.
Gascon Paper Co.
The Union Paper & Twine Co.
COLUMBUS, O. — Central Ohio Paper Co.
Cinti. Cordage & Paper Co.
Diem & Wing Paper Co.
Standard Paper Co.
CORPUS CHRISTI, TEX. — Magnolia Paper Co.
DALLAS, TEX. — Lind-Reed Paper Co.
Magnolia Paper Co.
DAVENPORT, IOWA — Peterson Paper Co.
DAYTON, OHIO — F. W. Lotz Paper Co.
DETROIT, MICH. — Beecher Peck & Lewis
Butler Paper Co.
Union Paper & Twine Co.
EAST HARTFORD, CONN.
Carter-Rice-Storrs & Bement, Inc.
EVANSVILLE, IND. — Capital Paper Co.
FT. WAYNE, IND. — Korte Paper Co.
FT. WORTH, TEX. — Western Paper Co.
Lind Paper Co.
GRAND RAPIDS, MICH. — Grand Rapids Paper Co.
HAMMOND, IND. — Inlander-Steindler Paper Co.
HIGH POINT, N. C. — General Paper Company
HOUSTON, TEX. — Houston Paper Co.
Magnolia Paper Co.
INDIANAPOLIS, IND. — Capital Paper Co.
Crescent Paper Co.
JACKSON, MISS. — Townsend Paper Co.
JERSEY CITY, N. J. — S. Safier Co.
KALAMAZOO, MICH. — Bermingham & Prosser Co.
KANSAS CITY, MO. — Bermingham & Prosser Co.
Standard Paper Co.
LANSING, MICH. — Dudley Paper Co.
LITTLE ROCK, ARK. — Arkansas Paper Co.
Roach Paper Co.
LOUISVILLE, KY. — Louisville Paper & Mfg. Co.
Southeastern Paper Co.
MEMPHIS, TENN. — Mayer Myers Paper Co.
Wurzburg Brothers, Inc.
MILWAUKEE, WISC. — W. H. Kranz Co.
Wisconsin Paper & Products Co.
MINNEAPOLIS, MINN. — John Leslie Paper Co.
MONROE, LA. — Bancroft Paper Co.
Louisiana Paper Co.
MUNCIE, IND. — Schwartz Paper Co.
MUSKEGON, MICH. — Steindler Paper Co.
NASHVILLE, TENN. — Clements Paper Co.
NATCHEZ, MISS. — Bancroft Paper Co.
NEENAH, WISC. — Sawyer Paper Co.
NEW HAVEN, CONN.
Carter-Rice-Storrs & Bement, Inc.
NEW YORK, N. Y. — Franklyn Paper Co.
OKLAHOMA CITY, OKLA. — Oklahoma Paper Co.
OMAHA, NEB. — Nogg Bros. Paper Co.
PAWTUCKET, R. I.
Carter-Rice-Storrs & Bement, Inc.
PHILADELPHIA, PA. — W. B. Kilhour & Sons, Inc.
Terminal Paper Co.
PITTSBURGH, PA. — Balter Paper Co.
Chatfield & Woods Co. of Penna.
Interstate Cordage & Paper Co.
RACINE, WISC. — W. H. Kranz Co.
SAGINAW, MICH. — Dudley Paper Co.
SHREVEPORT, LA. — Bancroft Paper Co.
Louisiana Paper Co.
SPRINGFIELD, ILL. — Capital City Paper Co.
SPRINGFIELD, MO. — Springfield Paper Co.
ST. JOSEPH, MO. — Sheridan-Clayton Paper Co.
ST. LOUIS, MO. — American Commission Co.
Rosenthal Paper Co.
Royal Papers, Inc.
Shaughnessy-Kniep-Hawe Paper Co.
ST. PAUL, MINN. — Anchor Paper Co.
TEXARKANA, TEX. — Louisiana Paper Co.
TOLEDO, OHIO — Central Ohio Paper Co.
TULSA, OKLA. — Tulsa Paper Co.
TYLER, TEX. — Etex Paper Co.
WACO, TEX. — Lind Paper Co.
WALTHAM, MASS. — Waltham Bag & Paper Co.
WASHINGTON, D. C. — R. P. Andrews Paper Co.
WICHITA, KANSAS — Southwest Paper Co.
WICHITA FALL, TEX. — Empire Paper Co.
WORCESTER, MASS.
Carter-Rice-Storrs & Bement, Inc.

For More Information Write No. 216 on Inquiry Card—Page 32


ANOTHER IN A SERIES
OF MOTOR FACTS
FROM ALL INDUSTRIES

Sand... heavy rain... extreme heat...

Nothing stops These Westinghouse Life-Line "A" Motors

dependably driving oil well pumps in Odessa, Texas district of The Atlantic Refining Company, 24 hours per day, 7 days a week!

"Here's an application," says A. P. Johnston, production engineer at The Atlantic Refining Company, "where we must have continuous motor operation . . . sometimes for as long as 18 months . . . with virtually no maintenance or repair. Many of our pumping stations are remotely located, automatic and unmanned. Any stoppage or motor failure would result in the loss of several hundred barrels of oil. Motor repairs in the field are prohibitive in cost. We must have *complete* motor reliability and that's exactly what we get from our Westinghouse Life-Line® "A" motors."

How about you? Got a really tough motor application which you can't afford to pamper? Then ask your Westinghouse sales engineer to show you how the dependable Life-Line "A" pays for itself through reduced maintenance and repair. Or write to Westinghouse Electric Corp., P.O. Box 868, 3 Gateway Center, Pittsburgh 30, Pennsylvania. J-22055-R

YOU CAN BE SURE...IF IT'S Westinghouse



On this pumping unit, the 15-hp Life-Line "A" motor operates in an atmosphere of damaging dust, sand and moisture. Despite continuous, heavy-duty service, motor has never suffered any overheating since first installed. Prelubricated bearings of the Life-Line "A" eliminate periodic greasing . . . keep lubricant in . . . dirt out.

For More Information Write No. 217 on Inquiry Card—Page 32

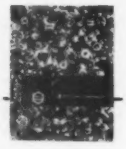
Fischer

has produced more than 2500 types of SPECIAL and odD Size precision nuts... including miniatures!



Let us quote your next order!

For details on Fischer *Turned* Brass and Aluminum Nuts, Send for catalog FS-1000.



Fischer Special Mfg. Co.
47 · Morgan St.
Cincinnati 6, Ohio

Please send Catalog FS-1000 and Price Lists on Fischer Brass and Aluminum Nuts.

NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

8429-FS

Fischer
SPECIAL MFG. CO.
471 MORGAN STREET
CINCINNATI 6, OHIO

TURNED NUTS Fischer SPECIAL MFG. CO. CINCINNATI OHIO SINCE 1905

For More Information Write No. 218 on Inquiry Card—Page 32

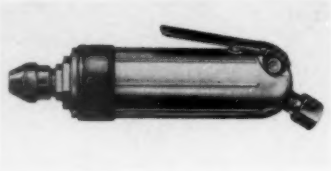
Products

(*Continued from page* 104)

in many industrial safety programs. Ultra-high-intensity illumination is supplied by 65,000 candlepower aircraft landing light which has minimum life of 100 hours. Entire unit, including cord and transformer, is completely sealed in heavy, vulcanized neophreme rubber. **Burton Mfg. Co., 2520 Colorado Ave., Santa Monica, Calif.**

Write No. 21 on Inquiry Card—Page 32

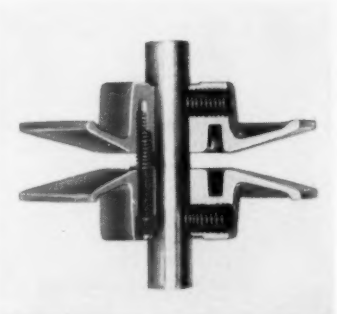
Air Die Grinder with Controllable RPM's



A new air die grinder featuring a metering trigger delivers 0 to 25,000 controllable RPM's, permitting operator to "throttle down" for feather edging. Grinder is recommended for polishing, wire brushing and metal removal on dies, stampings, gear teeth, castings, etc. It takes standard rotary files, standard or carbide wheels, wire brushes, mounted points and sanding drums. Wheel capacity is 1¼ in. vitrified and 1½ in. organic. Weight is 15 oz., length 6 in. **Superior Pneumatic & Mfg., Inc., 13800 Enterprise Ave., Cleveland 35, Ohio.**

Write No. 22 on Inquiry Card—Page 32

New Variable Pitch V-Belt Pulley



A 3-¼ in. diameter variable pitch v-belt pulley provides micro-

(*Please turn to page* 114)

For More Information about ad on facing pg. Write No. 219 on Inquiry Card—pg. 32→



Fort Howard Paper Company

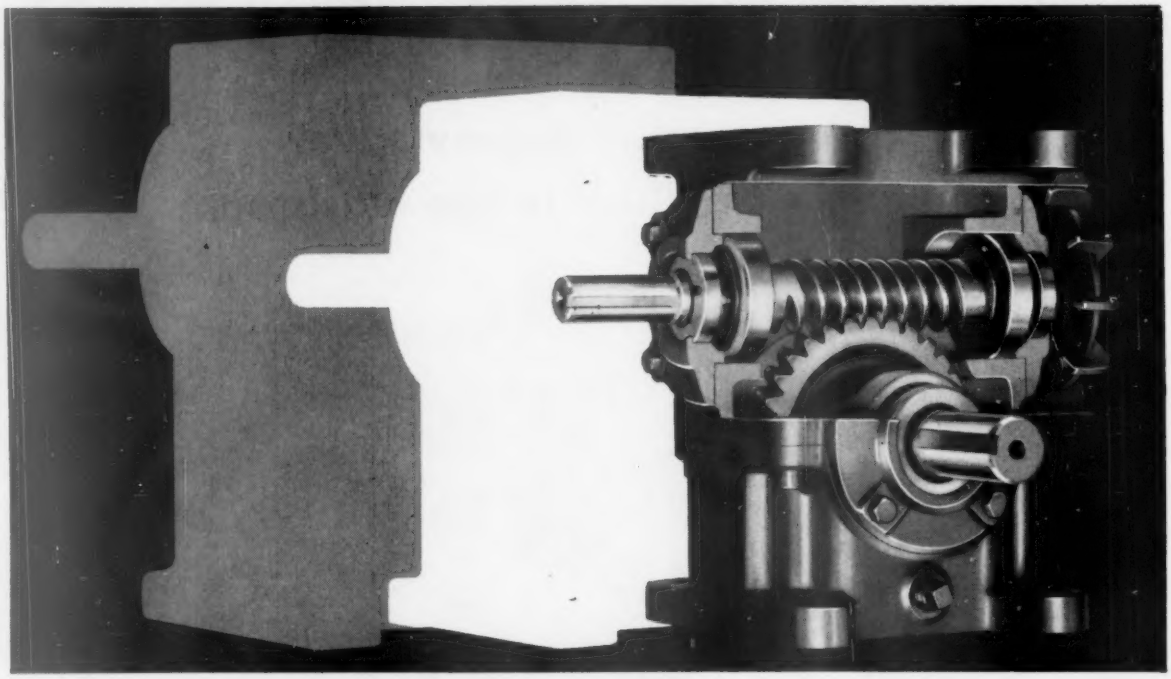
Green Bay, Wisconsin

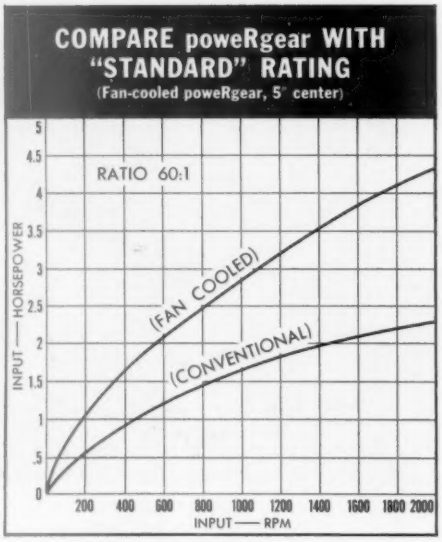
America's most complete line of paper towels, tissues and napkins

●Fort Howard Paper Company

Based on performance, Morse Eberhardt-Denver Speed Reducers give you:

MORE CAPACITY FOR YOUR MONEY





These curves compare a 5 inch center distance poweRgear with a 5 inch center conventional non-fan cooled heavy duty unit. Because of its fan-cooled design and extra-heavy construction, a Morse E-D poweRgear Speed Reducer easily exceeds "standard" ratings . . . delivers more horsepower per dollar!

Fan and fin cooling, extra-heavy-duty construction let poweRgear® do *more* work in a given size; you save space and weight, often trim initial costs

You get *more* than "rule-of-thumb" ratings call for, when you specify stock Morse Eberhardt-Denver poweRgear Speed Reducers. You pick and pay for the capacity you *need* . . . get it, as set realistically by exhaustive laboratory tests and critical on-the-job ratings.

Fan-and-fin cooling holds operating temperature down, sends rated life up on a poweRgear reducer. Its universal design permits mounting in bottom, top or vertical positions and includes extra-heavy housing, shafts and bearings. Result: you can specify a smaller, lighter, more compact unit to do your job . . . get *more* capacity for every reducer dollar.

There's a Morse E-D poweRgear reducer for *every* job: fractional to 40 H.P.; ratios from 5:1 to 3600:1; center distances from 2" to 7". Other Morse E-D speed reducers: conveyor drives; miter boxes; helical reducers; gear motors; worm and gear sets.

FOR MORE FACTS, call your Morse distributor today (see the Yellow Pages under "Power Transmission.") Or write: Morse Chain Company, Dept.15-129,Ithaca, N. Y. Export Sales: Borg-Warner Intl., Chicago 3, Ill. In Canada: Morse Chain of Canada, Ltd., Simcoe, Ont.

MORSE

MORSE B-W

*Trademark

A BORG-WARNER INDUSTRY

ONLY MORSE OFFERS ALL 4: Chain and "Timing"® Belt Drives; Speed Reducers, Couplings, Clutches

For More Information Write No. 220 on Inquiry Card—Page 32



Put these trucks to work... without buying them!

No capital necessary, when you rent from Clark. For one budgeted monthly payment, you get the new equipment you need . . . including all maintenance and repair service.

Because of the modest cost, many companies use the Clark Rental Plan for all their handling equipment needs. Others, faced with peak work loads or seasonal demands, use the Rental Plan to *supplement* their regular fleet. Working capital is saved either way.

You can rent for a week or a year, based on your need. You can adjust your rental period as your requirements change. Most important, you can have the necessary equipment when you need it to keep operating costs down. Complete details of the Clark Rental Plan are available on request. Write: Truck Rentals, Clark Equipment Co., Battle Creek, Michigan.

CLARK® EQUIPMENT

For full details, circle 77 on reader service card

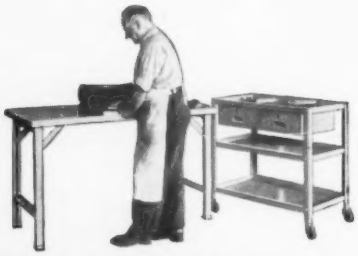
Printed in U. S. A.

top dollar values

BORROUGHS SHOP EQUIPMENT

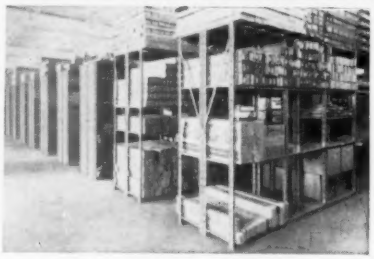
The name "Borroughs" on the shop equipment you buy means you have made a good sound choice. Borroughs Shop Equipment is rugged from top to bottom . . . work bench tops are specially constructed to achieve an unusual reduction in "drum" effect . . . work benches can be adapted to many different bench and table combinations with Borroughs accessories . . . and there are many other reasons why Borroughs Shop Equipment is in such wide use today. Before you buy any type of shop equipment, send for the full story of the Borroughs line.





BORROUGHS STEEL SHELVING





If you want the most simple, most flexible, most rapidly assembled shelving in America today, then specify BORROUGHS — the Steel Shelving with the most efficient, easiest-to-use Shelf Support Brackets known to the industry. You merely insert Shelf Support Brackets into post slots — then tilt shelf into Support Brackets — and you're ready for business. Except for the top shelf (2 nuts and 2 bolts), no other nuts or bolts are required for shelves — and no special tools are needed to assemble units. Any unit or shelf can be moved independently. Get more facts.

send for catalog

Represented in Sweet's Catalog, Plant Engineering File 4G BO

BORROUGHS MANUFACTURING COMPANY OF KALAMAZOO

A SUBSIDIARY OF THE AMERICAN METAL PRODUCTS COMPANY OF DETROIT

3014 NORTH BURDICK ST. amp® KALAMAZOO, MICHIGAN

For More Information Write No. 221 on Inquiry Card—Page 32

Products

(*Continued from page* 110)

meter adjustment to set pitch to desired RPM required on driven pulley. Each half of the pulley is directly fastened to the motor shaft, eliminating any parallel or angular misalignment between halves. Easy method of adjustment provides for truer running and perfect balance regardless of opening between halves. Better concentricity between groove and bore is assured (.010 in. total indicator reading maximum). Available in ½ to ⅝ in. bore sizes. **Congress Drives Div., Tann Corp., 3750 E. Outer Drive, Detroit 34, Mich.**

Write No. 23 on Inquiry Card—Page 32

New Patch Brick for Furnace Repair

A new basic refractory patching brick is intended for maintenance work on furnace roofs. New brick eliminates the need to secure patch brick to tie rods or other supports in the furnace roof structure. Special slot-support clip design permits patch bricks to be supported by adjacent bricks. Clip can take variety of shapes, with special clips provided for specific furnace installations. **Harbison-Walker Refractories Co., Farmers' Bank Bldg., Pittsburgh 22, Pa.**

Write No. 24 on Inquiry Card—Page 32

Miniature Nylon Cap Clinch Nuts



A new miniature self-locking clinch nut with an integral nylon cap is designed for high voltage circuits in miniaturized electric

(*Please turn to page* 118)

For More Information about ad on facing pg. Write No. 222 on Inquiry Card—pg. 32→



J. F. HARPER, OF HARPER
BUFFING MACHINE COMPANY, SAYS . . .

"General Electric Motor *Econo-matching** Saved Me Over $1300 Per Machine!"

***GENERAL ELECTRIC ECONO-MATCHING** is the quick and accurate matching of Tri-Clad '55' a-c motors to machines by skilled G-E engineers.

ECONO-MATCHING recently helped increase equipment efficiency and reduce unit costs at Harper Buffing Machine Company, East Hampton, Connecticut.

After selecting a drive to power his new "Harperizer†" free-grain buffing machine, J. F. Harper (above center) called his G-E Distributor, who in turn arranged for a team of General Electric Econo-matching engineers to study its drive requirements —at no cost to Mr. Harper!

"G-E ENGINEERS STUDIED OUR APPLICATION," said Mr. Harper, "and advised that we could get maximum efficiency and economy by replacing the drive we had selected with a Tri-Clad '55' 50-hp open drip-proof motor. We did, and realized an immediate savings of over $1300 per unit!"

MORE THAN THREE BILLION integral-hp a-c motor types are available to the G-E engineers who can select the drive to meet your needs. Let them help you get the most from your equipment investment!

†Trademark of Harper Buffing Machine Co.

GENERAL ELECTRIC

‡ Registered Trademark of General Electric Co.

RETURN THIS COUPON . . .
for more Econo-matching details, or call your nearby General Electric Apparatus Sales Office for complete information on how G.E. can ECONO-MATCH a motor to meet your specific requirements.

Section H891-22A
General Electric Company
Schenectady, New York

Please furnish more information on how you can ECONO-MATCH a motor for my application, which is_____

NAME_____ TITLE_____

COMPANY_____

CITY, STATE_____

NOW for the first time anywhere

V-R GIVES YOU PREMIUM GRADE CARBIDE AT STANDARD PRICES

The company that first developed carbides for machining steel . . . the company that introduced throw-away inserts . . . now announces another first . . . putting the "premium" on quality instead of price. V-R has eliminated all price differentials between carbide grades . . . simplifying carbide pricing and making it easier for you to order, stock and use V-R carbide.

New equipment, new methods, new processes and increased production volume make this standardized pricing possible . . . while assuring you of the same high quality and superior machining performance you've learned to expect from V-R carbide.

Standardized pricing is only one part of what's new at V-R. Watch for this modern corporate emblem. You'll soon be seeing it everywhere . . . calling your attention to new happenings of real value to you and your company.

V-R

Creating the metals that shape the future

VASCOLOY-RAMET

860 MARKET STREET • WAUKEGAN, ILLINOIS

C-760

For More Information Write No. 223 on Inquiry Card—Page 32



One NATIONAL TRADE-MARK brush grade conquered Contamination—Humidity—Low Loads!



MORGAN HENIKA

"Commutator trouble was a big expense item in this eastern pulp and paper plant," says "National" Carbon Brush Man, Morgan Henika. "And no wonder," continues Morgan, "paper machine drives worked on low loads in a highly humid, contaminated atmosphere!"

Morgan recommended "National" Brush Grade HRG. The results were outstanding—trouble-free performance and big maintenance savings. Today this brush grade is used on almost all drives in the mill.

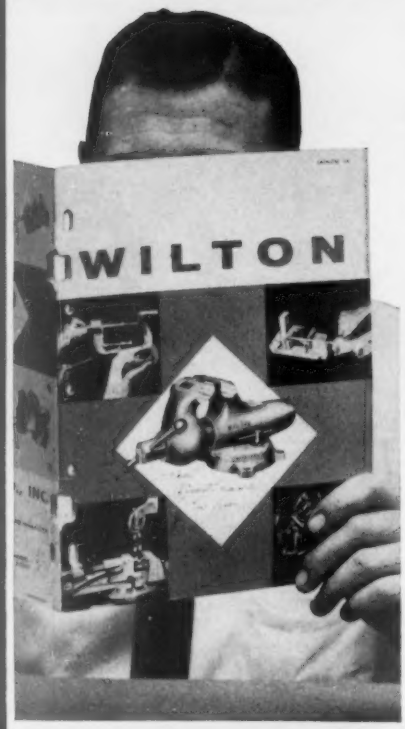
Don't give up on *your* brush problem until you call your "National" Carbon Brush Man. His experience—*backed by "National's" long term brush research*—may be just the help you need. Call your local office or write to National Carbon Company, Division of Union Carbide Corporation. 30 East 42nd Street, New York 17, N. Y.

"National", "N" and Shield Device, and "Union Carbide" are registered trade-marks of Union Carbide Corporation

NATIONAL CARBON COMPANY • **Division of Union Carbide Corporation** • ***30 East 42nd Street, New York 17, N. Y.***

OFFICES: Atlanta, Chicago, Dallas, Houston, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **CANADA:** Union Carbide Canada Limited, Toronto

For More Information Write No. 224 on Inquiry Card—Page 32



Exciting new best seller! Yours FREE!

● Wilton's new "book" is more than a catalog! It's actually a production know-how manual that shows you in-plant photos and operating case histories of how Wilton clamping tools (both manual and powered) have been used by the best brains in the business to save production time and money. Of course we show our line, and that too is unique—**Wilton has the most complete line of clamping tools in the world.** Write for your copy now; it's an education that will pay dividends in your plant. No obligation, of course.

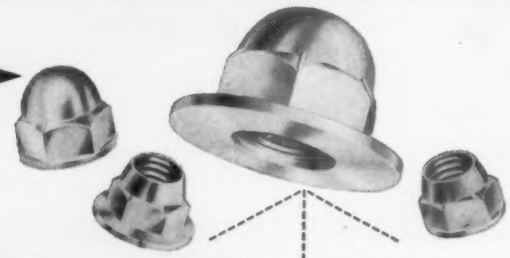
WILTON

Wilton Tool Manufacturing Co. Inc.
Schiller Park, Illinois

PM-129

For More Information Write No. 225 on Inquiry Card—Page 32

another new exclusive GRC idea



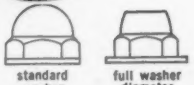
GRC die cast zinc alloy

washer-base CAP NUTS

GRC makes new exclusive low cost fasteners with integral Washer bases for better fastening performance and appearance. Won't mar soft surfaces. Use with oversize or offset holes. Prevents wrench marks. All these advantages at no extra cost to you. Use standard diameter nuts wherever regular cap nuts would be used alone—full diameter nuts wherever regular cap nuts would be used with separate washers.

- **Standard thread sizes from No. 4 through ½"—14 hex sizes.**
- **Rustproof and corrosion resistant**
- **No tool marks or cut off burrs**
- **Save assembly time—inventory costs**

Cap Nuts and Wing Nuts in a wide range of styles and sizes. Write today for new detailed catalog.



Both closed end and open end washer base cap nuts available with full and standard washer diameters. In addition GRC has the most complete stock of Standard CAP NUTS.



GRIES

GRIES REPRODUCER CORP.

World's Foremost Producer of Small Die Castings
39 Second St., New Rochelle, N. Y. • NEw Rochelle 3-8600

For More Information Write No. 226 on Inquiry Card—Page 32

Products

(*Continued from page 114*)

components. Nylon cap protects bolt threads against corrosion and chafing of wires, effectively limits corona and electrical discharge and seals internal or external pressures up to 80 psi past the bolt threads. Installation may be by hand or volume production. Shank lengths of .040 and .060 can be had in each thread size. Nut is available in thread sizes 4-40 through 10-32. **Elastic Stop Nut Corp. of America, 2330 Vauxhall Rd., Union, N. J.**

Write No. 25 on Inquiry Card—Page 32

New Compact Electronic Comparator

A new precision comparator measures only 14½ x 8⅛ x 9¼ in. Instrument can be set up in seconds simply by plugging into normal 110 volt outlet. It is ideal for inspecting materials received, spot checking during production runs, or post process gaging. Operator has only to observe the registered high, low and acceptable limit lights on the meter panel. Nine different gage heads permit direct readings ranging from .000050 to .001 in. per dimension. **Radio Corp. of America, 30 Rockefeller Plaza, N. Y. 20, N.Y.**

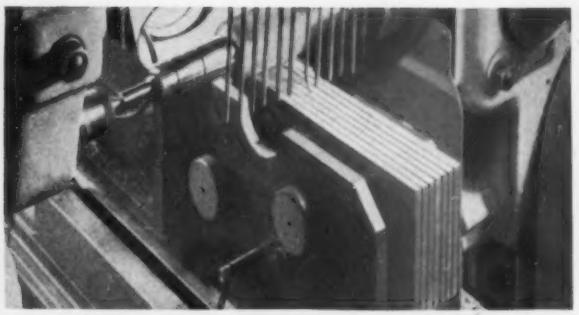
Write No. 26 on Inquiry Card—Page 32



"I paid way too much for the Christmas tree and I got stung on these drinks . . ."

To all the combined advantages of Synthane Laminated Plastics . . . add one more big plus—**MACHINABILITY**









There are many reasons why plastic laminates such as Synthane are well regarded. They offer—in combination—resistance to heat, wear, chemicals, oil, water; light weight; excellent dielectric properties and mechanical strength; dimensional stability. On top of all these, however, is the one property that makes Synthane practical—Machinability.

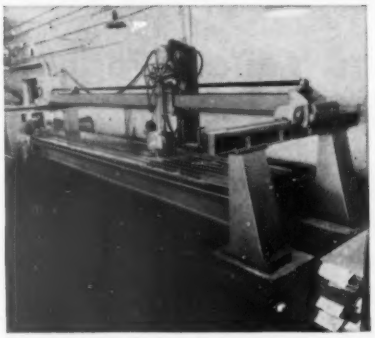
This means that whatever your application you may obtain parts of Synthane in the form desired and at a reasonable cost whether you require one or a million.

How Machinable is Synthane?

Synthane laminates are easy to machine, using ordinary wood or metal working machinery with only a few modifications of method. As an example, here are some standard machining operations readily performed on Synthane:

Shearing	Screw Machine Operations
Band Sawing	Planing
Circular Sawing	Shaping
Drilling	Punching
Tapping	Broaching
Fly cutting	Shaving
Milling	Sanding
Gear cutting	Grinding
Turning	Boring
Turret Lathe Operations	Tumbling
	Buffing

Practically all of these operations can be handled on standard machines, many with standard cutters. But the nature of the material, being softer and more resilient than metal, and being laminated and a poor heat conductor, often makes the use of cutters with special rake and clearance, operating at special feeds and speeds, desirable.



Sawing long lengths. One of the numerous special tools whose advantages are available when Synthane fabricates the material.

The successful machining of Synthane laminates is aided by proper design of parts for ease of machining. A Synthane booklet: "Design Hints for Laminated Plastics*" adequately covers design recommendations.

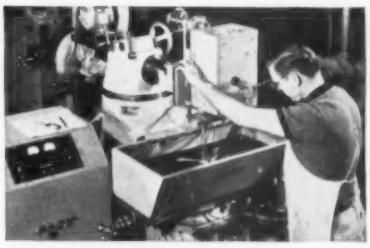
It pays to let Synthane machine laminated plastics for you

Although Synthane laminated plastics are easy to machine, it will usually pay you to have us handle the machining for you—for these reasons:

1. All of our equipment is especially designed or adapted for the fabrication of plastics.
2. We are constantly developing new, faster, and more economical methods of machining Synthane laminated.
3. We make all of our own tools, dies, fixtures and jigs, quickly and economically.
4. We relieve you of all production worries: machining errors, rejects, waste, mistakes in dimensions or tolerances, and delays in delivery.
5. Because we combine manufacturing and fabrication in one location, we can maintain high quality control while solving difficult machining problems. When necessary, we can even modify the properties of a given grade of material to meet special requirements.

For further information, write Synthane Corporation, **7 River Rd., Oaks, Penna.**

**Booklet available upon request.*



Metal disintegration, a fast, economical way Synthane uses to produce or revise dies.

SYNTHANE

CORPORATION, OAKS, PENNA.

Laminated Plastics for Industry

Sheets, Rods, Tubes, Fabricated Parts
Molded-laminated, Molded-macerated



"Day-in, day-out, the Yellow Pages makes a buyer's job easier,"

says J. A. Czescik, Mgr. of Purchasing, Pitney-Bowes, Inc., Stamford, Conn.

"As far as our four buyers and I are concerned, locating an *unusual* item is a *usual* event in a purchaser's day. When it comes to finding suppliers for these items, or when our regular suppliers can't provide our needs, we all rely on the Yellow Pages. Whether it's a tent for serving refreshments at an 'Open House' for our expanded and refurbished plant, a nursery to landscape our grounds, a contractor to mark out a parking field, or a stationery order we need in a hurry — we find reliable local suppliers easily in the Yellow Pages."

Yes, whatever your purchasing needs, the Yellow Pages makes thousands of items, hundreds of reputable suppliers easily available. So keep this valuable buyers' guide handy, and turn to the Yellow Pages *first* when you want to locate anything *fast!*



YP IS USED BY P B to find sources of supply *and* to tell people where to find P B sales and service.

PITNEY-BOWES POSTAGE METERS

Originators of the POSTAGE METER and METERED MAIL
Complete Line of Mailing Equipment
Postal Scales, Letter Openers
Folding and Inserting Machines
Counting and Imprinting Machines

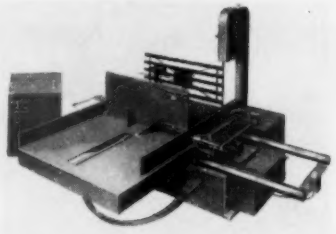
PB

"WHERE TO OBTAIN THEM"
BRANCH SALES & SERVICE
PITNEY-BOWES INC
630 Third Ave..... MUrphil 2-4400

For More Information Write No. 228 on Inquiry Card—Page 32

Products

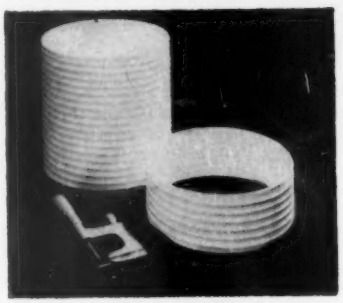
New, Fully Automatic Band Saw



A new band saw with fully automatic operation is designed for high speed production cutting of carbon, wood, rubber, plastics, cardboards, and many other materials. Saw will handle up to 4 x 5 ft. sheets 20 in. thick with slices taken from the 4 ft. end. Maximum size of slice is 50 x 14 x ¼ in. Machine is 73 in. high, 103 in. front to back, 110 in. side-to-side, and weighs 3200 lbs. Blade size is 13 ft. 2 in. x 1 in. x .035 in. Blade speeds and HP to suit needs. **W. F. Wells & Sons, Three Rivers, Mich.**

Write No. 27 on Inquiry Card—Page 32

New Ceramic Technique for High-Precision Uses



New ceramic forming, firing and grinding techniques permit the fabrication of extremely thin-wall, large-diameter ceramic cylinders for coil forms, pistons and other precision applications. Wall cylinder illustrated is typical. 5-1/16 diameter x 3/32 in. unit of 95% high alumina is 5.062 in. plus or minus .002 in. OD, 4.875 plus or minus .005 in. ID, and 4¾ in. long. Tolerances of plus or minus .001 can be maintained if necessary. **Centralab, Div. of Globe-Union, Inc., 900 E. Keefe Ave., Milwaukee 1, Wis.**

Write No. 28 on Inquiry Card—Page 32
For More Information about ad on facing pg.
Write No. 229 on Inquiry Card—pg. 32 →



PHOTO BY KARSH OF OTTAWA

"Sharon Steel's interest and service makes our steel purchasing easier"—J. E. ROBISON, P. A., Smith-Erie Div., A. O. Smith Corp.

"When a supplier takes the pains Sharon Steel does to make certain their material is satisfactory in every way, it makes the purchasing job that much easier," says J. E. Robison, Purchasing Agent for the Smith-Erie Division of A. O. Smith Corp.

A. O. Smith's new ultra-modern gasoline pumps are quality designed with panels of stainless steel in the vital wear areas. Sharon salesman Gordon Garrett, pictured above left with L. F. Smith, Erie Plant Manager, and Robison, keeps abreast of every phase of manufacture. "For the desire to serve," says Robison, "you've got to hand it to the *Sharon Steel Corporation, Sharon, Pa.*"

SHARONSTEEL **SHARON** *Quality* **STEEL**



Specify the

T-J Spacemaker

for longer, more efficient cylinder service

You too—can reduce replacement expenditures—lower maintenance costs with the T-J Spacemaker cylinder line. Designed and engineered for ruggedness, and accuracy of operation, the Spacemaker assures longer, uninterrupted operation.

The T-J Spacemaker eliminates tie-rods, gives greater strength, saves space . . . and reduces costs in all push-pull operations. Immediate delivery in a complete range of styles and capacities . . . air or oil. Write for Bulletin SM 155-4, today. The Tomkins-Johnson Company, Jackson, Michigan.

WITH EXTRAS . . . AT NO EXTRA COST

1. METAL PISTON ROD SCRAPER—protects rod packing, cylinder bore and rod surface by removing all foreign particles.
2. NEW "SUPER" CUSHION for air or METALLIC SELF-ALIGNING MASTER CUSHION for oil.
3. HARD CHROME PLATED CYLINDER BORES AND PISTON RODS for greater protection and reduced wear.
4. ONE PIECE PISTON assures better alignment, longer bearing and packing life.
5. FORGED SOLID STEEL HEADS throughout entire line.
6. PILOTED PACKING GLAND with extra long bearing for additional strength and support to piston rod.
7. NO TIE-RODS TO STRETCH—gives you 360° port rotation . . . less space used . . . full strength.
8. STREAMLINED DESIGN . . . operating pressures to 200 PSI, air; 1,000 PSI oil, non-shock.

T-J TOMKINS-JOHNSON
RIVETORS · AIR AND HYDRAULIC CYLINDERS · CUTTERS · CLINCHORS

For More Information Write No. 230 on Inquiry Card—Page 32

Products

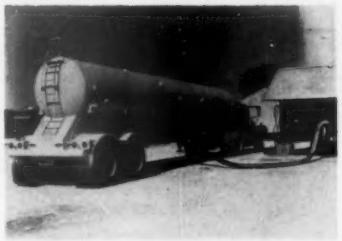
New Formula Capsule Eliminates Manual Errors



A new formula capsule eliminates manual errors in blending, proportioning and batching operations. Capsule automatically sets the correct proportions of feeds, grains, chemicals, flour and similar materials. Integrated with automatic proportioning panel, pocket-size control consists of network of miniature electronic components sealed in a shatter-proof protective cover. Unit can program the sequence and weighing of up to 24 solid and/or liquid ingredients in single formula. **Richardson Scale Co., Van Houten Ave., Clifton, N.J.**

Write No. 29 on Inquiry Card—Page 32

Bulk Shipping by Pressurized Trailer



A new pressurized highway trailer originally designed to haul dry cement can also cut shipping costs for bulk users of pulverized materials in food, construction, chemical, drug, lubricant-producing and many other industries. Filled through weather-proof top openings, trucks discharge their contents through four-unit flexible hoses. Discharge power is provided by low-pressure blowers which pump material at rates up to 37½ tons per hour or faster, depending on specific weight of product. **Delta Tank Mfg. Co., Inc., Baton Rouge, La.**

Write No. 30 on Inquiry Card—Page 32

Got a problem that calls for thread-cutting screws?

PARKER-KALON offers three new, improved thread-cutting screws for every application in every material



1 New, Improved P-K Type F*

. . . hardened thread-cutting screws developed for use in friable, granular or brittle material. The pilot, with its five tapping flutes, cuts a machine screw thread as the screw is turned in. The Type F is ideal for making fastenings to ferrous and non-ferrous castings, bronze or brass forgings, heavy gage sheet metals, structural steels, plastics and resin-impregnated plywood.



2 "Pentap"... the new, Improved P-K Type B-F*

(formerly F-Z) combining the five thread-cutting flutes of the Type F screw with the coarse-pitch, widely-spaced threads of the P-K Type B. The thread-cutting "Pentap" Type B-F distributes cutting pressure evenly, lets chips drop to the bottom of the hole, and prevents cracking of material. It is designed for making fastenings to comparatively thin sections and bosses in friable and brittle plastics.



3 P-K® Type L†

. . . is a completely new and improved thread-cutting screw developed by Parker-Kalon especially for use in Nylon. The Type L functions as a combination thread-cutting and thread-forming screw in that it cuts a small amount of the Nylon to allow the full diameter threads to form. Type L offers a particular advantage in Nylon assemblies which must be disassembled for service, because *the P-K Type L can be removed and replaced without stripping or galling.*

The five cutting flutes on the new, improved P-K Type "F" and "BF" reduce pressure development by 80 percent! The completely formed threads on these screws have sharper cutting edges, and 5 deep flutes that are of continuous depth. These features make for better clearance of the accumulated material and assure minimum stresses in driving, and avoid the possibility of stripping or galling.



FOR SEMS . . . and Neoprene or Nylon washer STAPS® in thread-cutting and thread-forming tapping screws, or machine screws in any kind of pre-assembled fastener-washer combination, P-K can supply them, too!

KEEP AMERICAN INDUSTRY AT WORK . . . BUY P-K . . . MADE IN U.S.A.

*Patent Pending †U. S. Patent 2,350,346

FOR SAMPLES OF P-K THREAD-CUTTING SCREWS AND SEMS, CALL YOUR LOCAL P-K "BULK-STOCKING" DISTRIBUTOR

PARKER-KALON® fasteners

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, New Jersey • Offices and Warehouses in Chicago and Los Angeles

For More Information Write No. 231 on Inquiry Card—Page 32

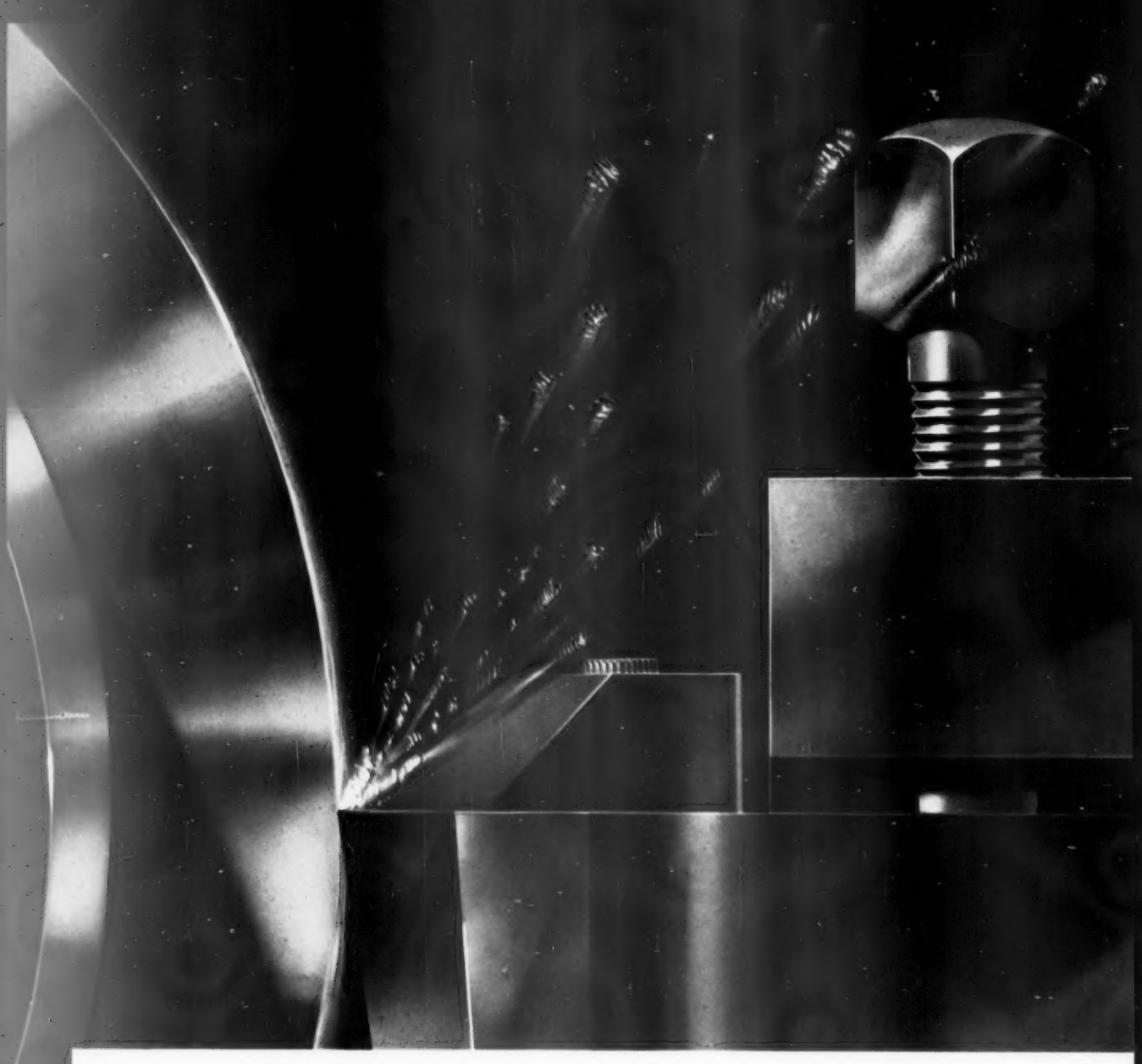


Illustration of Malleable casting being turned at 1,400 surface feet per minute with a 0.100" depth of cut using an oxide tool.

Machinability is Malleable

It's the finished cost of machined components that's important to you. Remember then . . . Malleable iron is more machinable than any other ferrous metal of similar properties. With Malleable castings you'll reduce machining time as much as 50% . . . increase tool life up to 250% . . . get unexcelled surface finishes . . . and end your reject problems.

To find out how much you can cut your costs and improve your profits, contact one of the progressive firms that displays this symbol—

MEMBER
MALLEABLE
CASTINGS COUNCIL

If you wish, you may inquire direct to the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio, for information.

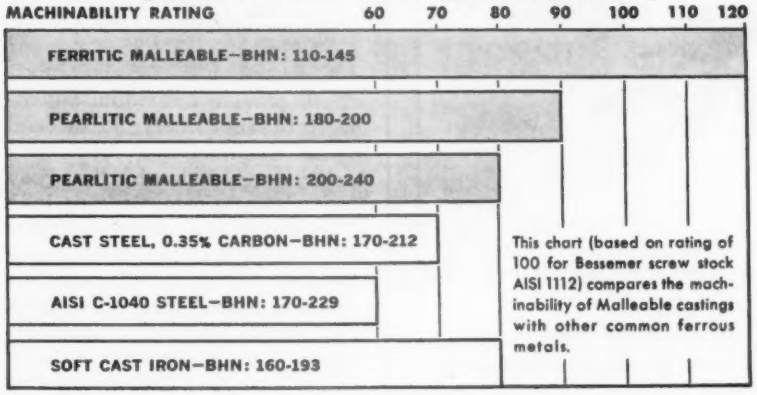
Machining Malleable Castings—Important Key to Cost Reduction

Malleable castings—the most machinable of all ferrous metals—cut quality components costs

Production men know that machining time, power consumption and rejects drop with the use of Malleable iron castings, while tool life and profits shoot up. The reason is simple: Malleable iron is the most machinable of all ferrous metals of similar properties.

The following important factors work together to give Malleable such machining superiority: Malleable's microstructure contains tiny, evenly distributed nodules of carbon that help cutting tools quickly break the removed metal into small (Class A) chips; the carbon also acts as a lubricant, prolonging tool life; uniformity of properties throughout every casting permits running at optimum machining conditions.

Comparison Shows Malleable's Superiority



Typical Example Shows Savings of 70% to 250%

The conversion of automotive universal joint yokes from steel forgings to pearlitic Malleable castings typifies the savings provided by Malleable castings. Costs for the rough pieces and performance characteristics of the two materials are comparable. However, the castings are much more economical to machine. Considering that machining often costs two to four times as much as the rough parts, the economy resulting from using Malleable castings is substantial.



Conversion of this universal joint yoke to a Malleable casting increased production, lowered direct and tool room labor, and cut tool replacement.

One volume user of Malleable joint yokes reports the following savings after changing from steel to Malleable castings: 70% longer tool life in broaching the splines; 250% more pieces cut by the nut seat cutters; 149% more pieces in turning and facing the hub; an increase of 100% in production between wheel dressings in grinding the hub; 246% greater production in drilling the cross holes.

In each of these operations, the change to Malleable castings cuts direct production time by reducing the frequency of tool changes. Tool room labor and tool replacement are both reduced to fractions of their previous costs.

Throughout the metalworking industry, part after part is now being initially designed of Malleable or converted from other materials to take advantage of Malleable's unrivalled machinability . . . to produce better parts at lower costs.

New Information Now Available on Machining Malleable

Data Unit 106—Machinability of Malleable Castings—can be obtained from any member of the Malleable Castings Council, or from the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

These companies are members of the

MALLEABLE CASTINGS COUNCIL

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Link-Belt Company, Indianapolis 6
Muncie Malleable Foundry Co., Muncie
National Mall. & Steel Castings Co., Indianapolis 22
Terre Haute Mall. & Mfg. Corp., Terre Haute

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW JERSEY
Meeker Foundry Company, Newark 4

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Canton Malleable Iron Co., Canton 5
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

WISCONSIN
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company Inc., West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

For More Information Write No. 232 on Inquiry Card—Page 32



CATAWISSA VALVE & FITTINGS CO.
CATAWISSA • PENNSYLVANIA
For More Information Write No. 233 on Inquiry Card—Page 32

COST OF PREVIOUS SERVICE.....$8.00 per week
COST OF TURN-TOWL SERVICE.....$2.10 per week
ANNUAL SAVING $306.80



Here is a typical case history of what happens when a consumer tests Turn-Towls against the towel service in use. This happened to a national firm's Buffalo (N.Y.) division.

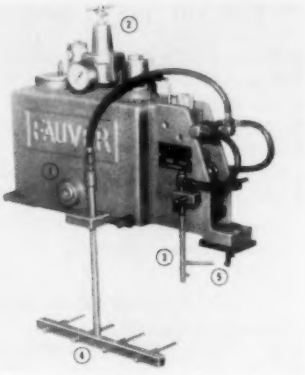
You can save with Turn-Towl service too. Write for name of nearest distributor now.

MOSINEE Sulphate Towels
BAY WEST PAPER CO.
1100 West Mason Street
GREEN BAY • WISCONSIN
Subsidiary of Mosinee Paper Mills Co.

For More Information Write No. 234 on Inquiry Card—Page 32

Products

Automatic Lubricators for Trolleys and Chains



New automatic conveyor lubricators provide individual adjustment of the wheel nozzle and wheel manifold for lubricating trolleys and chains by the spray method. Lubricator is especially effective where conveyors pass through kilns or ovens with breaking down of lubricant or where they pass through washers that cause corrosion. Cast aluminum two-gallon reservoir is strong enough to handle air line pressures up to 125 psi with a substantial safety factor. Plant air is stepped down to proper operating pressure by regulator. **J. N. Fauver Co., Inc., 51 W. Hancock, Detroit, Mich.**

Write No. 31 on Inquiry Card—Page 32

New Attachment for Handling Coiled Steel



An upending and rotating ram and fork attachment for use on heavy-duty electric trucks simplifies the handling of coiled steel. 21 hydraulic functions control the six major movements possible

(*Please turn to page* 130)



the triumph of an idea

AVERY labels

are pressure-sensitive for profitable production



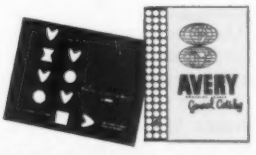
It all began with Avery . . . and an idea about a new type of "self-sticking" label —the world's first pressure-sensitive label!

The story of industry's acceptance of this label and its ever-growing use of pressure-sensitive labeling is truly the story of Avery—and the *Triumph of An Idea!*

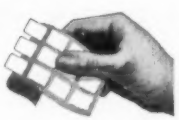
Modern Avery Labels have contributed much to efficient labeling methods and more profitable production, for unlike ordinary labels—all Avery Labels are *applied dry*—with a soft finger touch—for *clean*, pressure-sensitive labeling. Each label is individually diecut—on sheets or rolls—for manual or fast, automatic labeling.

Avery is the only manufacturer of self-adhesive products that has complete control of production facilities—from developing and mixing of the adhesives to the completed label. Specialized experience and "know-how" that is unequalled today!

May we tell you more about Avery Labels—and other Avery pressure-sensitive products...and show you how their greater efficiency will save you time and money?



Write for your **free** copy of AVERY's new labeling catalog and a colorful brochure describing Avery's new pressure-sensitive Metallics that are gaining swiftly in popularity as decorative trim, panels, nameplates.



AVERY LABEL COMPANY *a division of Avery Adhesive Products Inc.*
1616 South California Avenue, Monrovia, California

Here are but a few of the thousands of ways in which manufacturers are profitably using AVERY LABELS today



Samples of Avery Adhesive labels—removable KUM-KLEEN and permanent PERMA-GRIP—will tell you more than a thousand words. May we send yours?

AVERY LABEL COMPANY DIV. 130
117 Liberty St., N. York 6 • 608 So. Dearborn St., Chicago 5 • 1616 So. Calif. Ave., Monrovia, Calif.

☐ Please send free Avery catalog and the METALLICS brochure. ☐ Include KUM-KLEEN and Perma-Grip sample labels.

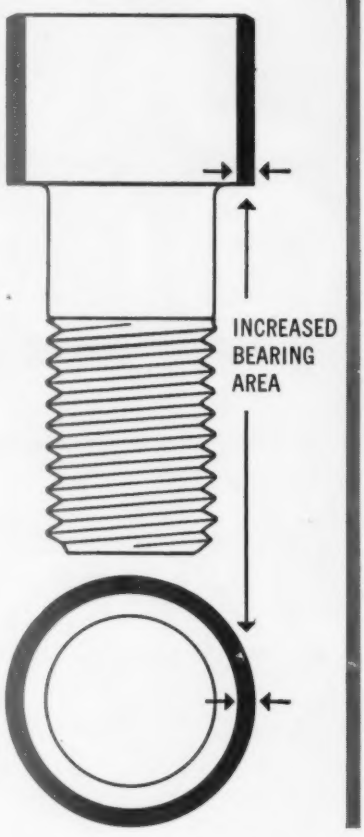
Name _____
Company _____
Address _____
City _____ Zone _____ State _____

For More Information Write No. 235 on Inquiry Card—Page 32

A MAJOR DEVELOPMENT IN SOCKET CAP SCREW DESIGN!

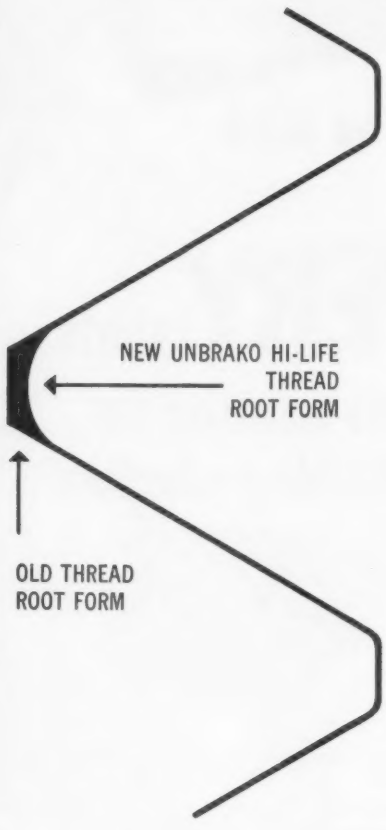
UNBRAKO *pHd** with Hi-Life thread— the advanced fastener for the 60's

Stronger in the head



UNBRAKO pHd design features increased bearing area under the head, bigger wrenching socket; provides up to 2⅓ times as much holding power without indenting bolted material. By permitting higher preloading, pHd helps eliminate fatigue failures, reduces possibility of screws working loose under shock and vibration.

Stronger in the thread

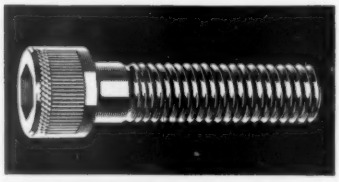


New UNBRAKO Hi-Life thread form has smoothly radiused root, slightly more metal at minimum cross section. Result: up to 100% greater fatigue life, plus a bonus in added tensile strength. Only UNBRAKO gives you the new, larger pHd head design and the improved Hi-Life thread . . . in a standard screw at no extra cost.

Anticipating tomorrow's demands today, SPS now offers you a standard socket head cap screw that incorporates both the UNBRAKO pHd design (1960 Series) *and* the new UNBRAKO Hi-Life thread.

This combination gives you a fastener that is unequaled in strength and performance. Because of its increased bearing area and bigger socket, you can tighten it tighter without deforming screw or bolted material. Thus you get more holding power—up to 2⅓ times as much, in fact. And because of both increased bearing area *and* new radiused thread root, the UNBRAKO pHd Hi-Life is almost twice as strong in fatigue.

The pHd head and Hi-Life thread —both originated by SPS—are tangible results of a continuing program of basic research in the design and performance of threaded fasteners. And they reflect to no little degree SPS experience in developing special high-strength fasteners for aircraft/missile use. Nevertheless, this new UNBRAKO is available to you as a standard—at no increase in price. For complete data, write SPS—manufacturer of precision threaded fasteners and allied products in many metals, including titanium.



New UNBRAKO pHd socket head cap screws with Hi-Life thread are available now from your authorized industrial distributor in standard sizes ¼ through 1 inch, plain or cadmium plated. Available also with the Nylok† self-locking feature. NOTE: UNBRAKO pHd Hi-Life screws fit standard tapped holes, require no special gaging.

†T.M. Reg. U.S. Pat. Off., The Nylok Corporation

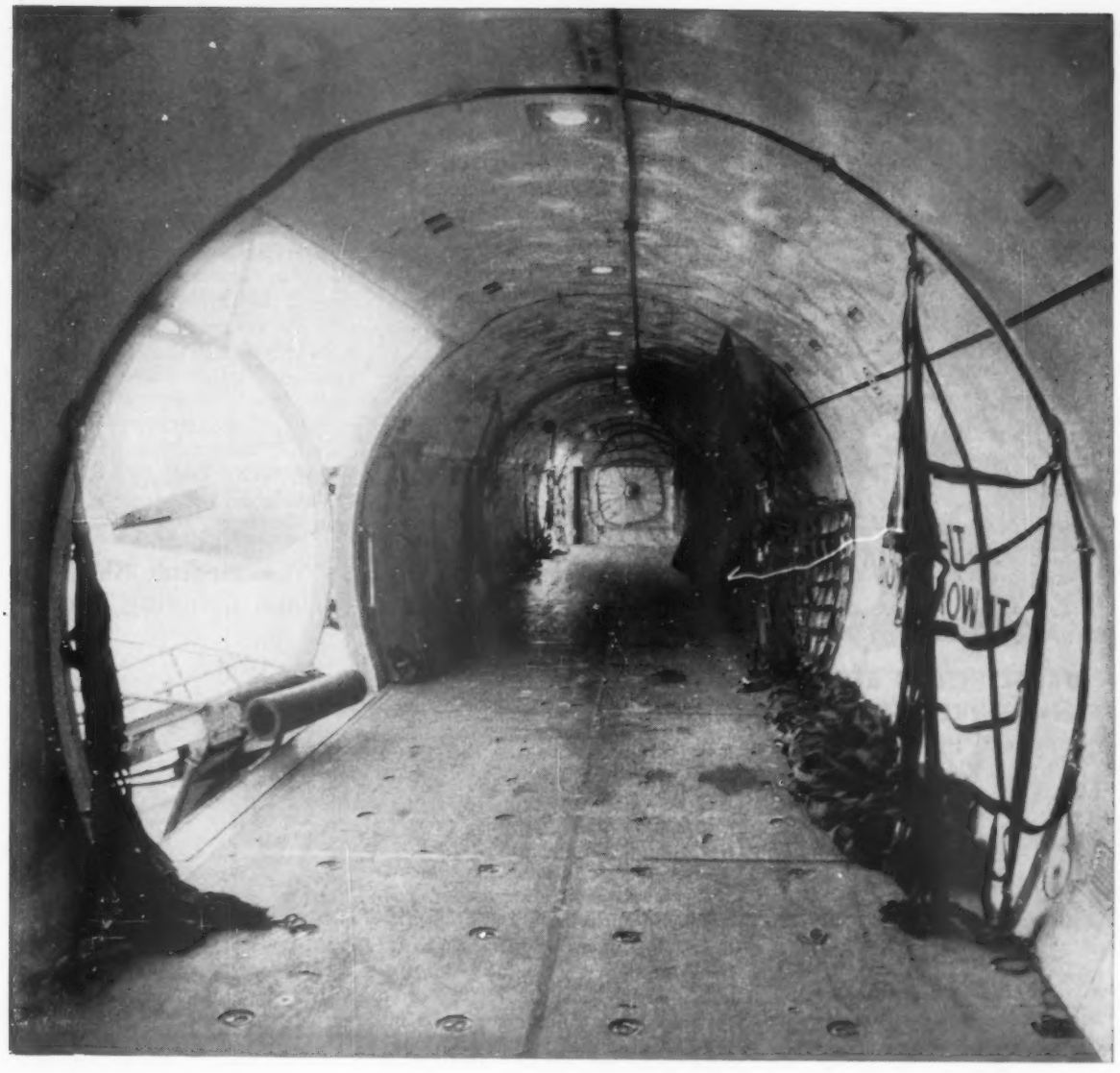
INDUSTRIAL FASTENER Division

JENKINTOWN 31, PENNSYLVANIA

SPS

*pHd stands for "proper head design"—a factor in higher product reliability

For More Information Write No. 236 on Inquiry Card—Page 32



This way out...of bottlenecks

AiResearch Manufacturing Divisions of The Garrett Corporation had the problem facing industry today... how to cut inventory to a minimum yet maintain production in the face of costly changes and vendor delays. The premium transportation then used was slow and undependable. Production bottlenecks occurred.

Management decided to move all critical parts by Emery Air Procurement Service. Emery's round-the-clock, door-to-door service proved to be fast, dependable and, at weights moved, it cost about the same as other air freight.

Perhaps Emery can help you in your procurement, distribution or promotion. Call or write us today. Offices in all major cities.

SEE WHAT YOU SAVE!*

	2500 Mi.		1700 Mi.		700 Mi.	
	Emery	Air Express	Emery	Air Express	Emery	Air Express
50 lb.	$25.54	$39.70	$20.93	$28.50	$14.77	$12.50
100 lb.	40.90	77.40	32.30	55.00	20.10	23.00
200 lb.	73.00	154.80	55.20	110.00	31.80	46.00

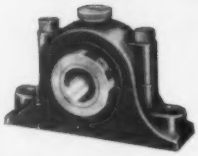
*Rates apply in most commodities between most major cities.

EMERY AIR FREIGHT CORPORATION

801 Second Avenue, New York 17, N.Y. • National and International Blue Ribbon Service.

For More Information Write No. 237 on Inquiry Card—Page 32





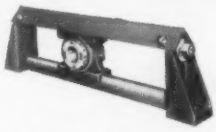
DODGE PILLOW BLOCKS with TIMKEN BEARINGS

America's Quality Pillow Blocks!



TAPER-LOCK STEEL CONVEYOR PULLEYS

Maximum strength with minimum weight!



DODGE TAKE-UPS

Complete range of stock models, sizes.

•

Write for Bulletins!

- Rolling Bearings — ratings, data.
- Conveyor Pulleys — technical data.
- Take-Ups — Roller, Ball, Babbitted.

DODGE MANUFACTURING CORPORATION
1300 Union Street • Mishawaka, Indiana

DODGE
of Mishawaka, Ind.

Products

(*Continued from page* 126)

with new device. Capacity of attachment ranges from 15,000 to 20,000 lbs. Using device, one man can handle and stack coils in normal ram truck fashion; rotate and upend coil to place it flat on pallet; remove coil from pallet and turn it for placement on a mandril; handle and stack palletized coils. **Yale Materials Handling Div., Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphis 15, Pa.**

Write No. 32 on Inquiry Card—Page 32

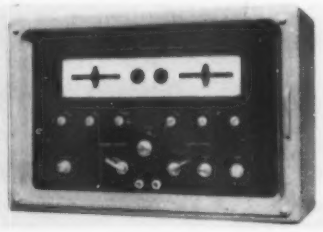
Automatic Adjustment of Welding Voltage



New 300 and 400 amp., direct-current, diesel-driven welders adjust welding voltage automatically. Only two indicators have to be set, one for electrode size and one for desired current. Welding range of 300 amp. machine is 60 amp. minimum at 20 volts and 375 maximum amp. at 40 volts. Range of 400 amp. unit is 80 amp. at 20 volts and 500 maximum amp. at 40 volts. Maximum open circuit voltage is 80v. Liquid-cooled diesel engines operate at welding speed of 2,150 rpm, idle at 1,050 rpm. **A. O. Smith Corp., Welding Products Div., Milwaukee, Wisc.**

Write No. 33 on Inquiry Card—Page 32

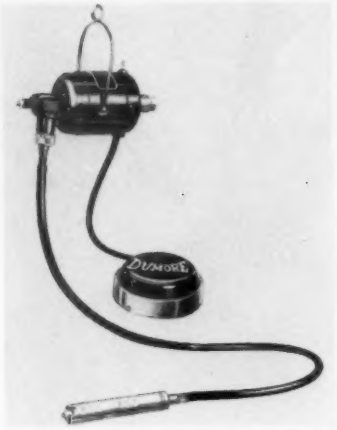
Newly Modified, Highly Accurate Bridge



A highly accurate transformer ratio-arm bridge has been modified to provide measurements of an impedance over a frequency range of 50 to 20,000 cps. Instrument provides facilities for two, three or four terminal measurements. Measurements provided are: capacitance, 0.0002 picofarad to 11 microfarad; resistance, 10 ohms to 100 megohms, inductance, 1 millihenry to infinity—all in seven ranges to an accuracy of 0.1 per cent. Bridge is ideal for measuring temperature and other coefficients of components placed in oven, refrigerator, pressure chamber or humidity chamber. **Wayne Kerr Corp., 1633 Race St., Philadelphia 3, Pa.**

Write No. 34 on Inquiry Card—Page 32

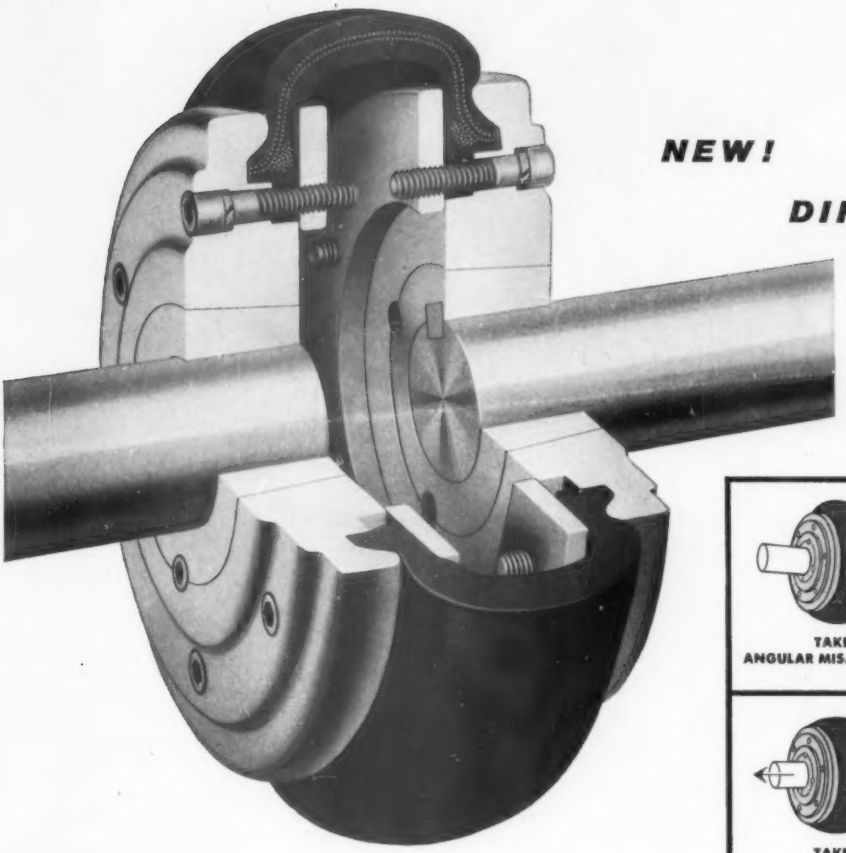
New Flexible Shaft Hand Grinding Tool



An advanced design, flexible shaft hand grinding tool provides speeds of 500 to 3500 RPM at the geared end and 3000 to 15,000 RPM at the direct drive end of the 1/15 HP universal type motor. Features include: accurate speed control through carbon pile, foot-operated rheostat; moisture, oil and grease-resistant 36 in. sheath; smooth vibrationless flexible shaft operating through bronze liner. Metal handpiece weighs only 6 oz. and is 5 in. long and 1 in. in diameter. Furnished with geared chuck 0-⅛ in. capacity. **Dumore Co., 1300-17th St., Racine Wisc.**

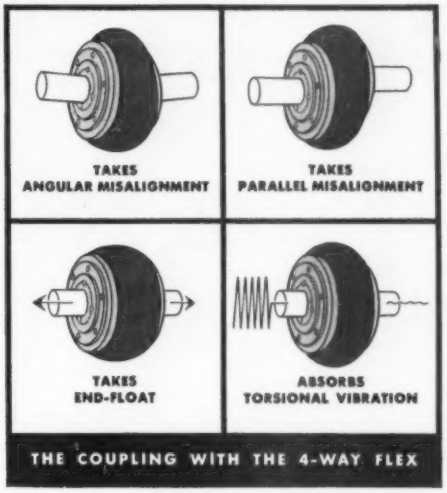
Write No. 35 on Inquiry Card—Page 32

FOR READER SERVICE CARD TURN TO PAGE 32



NEW!

DIFFERENT!



DODGE

Para-flex

FLEXIBLE CUSHION COUPLING

THIS coupling "swallows up" shaft misplacements. It automatically compensates for end-float, parallel misalignment, angular misalignment *or any combination of all three.* Moreover, it cushions the stresses of shock loads. And it absorbs torsional vibration—reducing noise and protecting machinery from vibration's destructive forces.

Here is a new type of performance—made possible by the development of a tire-like flexing element. Synthetic tension members, bonded together in rubber, give this element the stamina and dependability of modern, high-speed, high-load, shock-absorbing truck tires—and the ability to respond magically to all manner of changing shaft conditions.

Para-flex takes minimum space on the shaft. Mounting is simplified through the use of standard Taper-Lock bushings—no reboring, no machining. Safety is promoted by flush design; there are no protruding parts. No lubrication is required, no periodic inspection. And since the flexible member is molded with a transverse split, it can be replaced *without moving either the driver or driven machine.*

Para-flex Couplings are stocked by Dodge Distributors in popular transmission sizes. They are available from factory stock in capacities up to 2000 hp at 1080 rpm. Call your distributor for a coupling to *make your own test.* You'll witness something revolutionary!

DODGE MANUFACTURING CORPORATION, 1300 Union, Mishawaka, Ind.

DODGE

of Mishawaka, Ind.



CALL THE TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

For More Information about ad on following page Write No. 239 on Inquiry Card—pg. 32→

For More Information Write No. 238 on Inquiry Card—Page 32



E. S. Waters, Manager—Purchasing of General Electric's Large Steam Turbine-Generator Department discusses Productive Purchasing:

Today's Purchasing Agent Checks Added Values

No purchasing agent today would regard buying strictly on price as good purchasing—and certainly not as productive purchasing. The stature which the purchasing agent has achieved in the last twenty years is directly traceable to at least three things: his skill in applying such modern techniques as value analysis, the productive relationships he has established with other functions of the business—engineering and marketing, for example—and his skills in identifying total values in products and materials.

Purchasing agents who are concerned with increasing the profitability of their business will try to check off added values like these:

QUALITY CONTROL today goes beyond adherence to specifications and the use of statistical sampling methods. Check on a supplier's creative approach to reducing the cost and improving the results of this critical activity.

APPLICATION ENGINEERING capabilities of a supplier should be checked to avoid buying products which do not properly go together into an engineered system.

SERVICE backup can be evaluated on the basis of reputation, past performance, and facilities and people in place. This added value can be as important as price.

PRODUCT DEVELOPMENT or materials improvement is the kind of added value offered by creative suppliers who see their business dependent on helping you to offer better products and still hold prices in line.

INSTALLATION & SERVICE ENGINEERING are important capabilities to check on such products as electrical apparatus. See if your supplier can simplify start-up problems and help train operating personnel.

ANALYTICAL ENGINEERING offers you the latest tools of rapid analysis and research. Check to see if your supplier can make studies that will help improve the efficiency of your basic processes.

PROJECT CO-ORDINATION focuses the full capability of the supplier's management and engineering structure on your order for product combinations or systems. Check to see if he can give you this added value.

MARKET SUPPORT is available from relatively few suppliers. Assess the value of market and sales development programs undertaken by the supplier which contribute to the growth of your business.

PROMPT DELIVERY is an added value when the supplier takes steps (automating paper work, for example) to give you an even better delivery schedule.

VALUE ANALYSIS examines a finished product to assess added product functions, values, and economies. Check to see if your supplier is achieving savings along with product improvements by this method.

GENERAL ELECTRIC



FREE BULLETIN

SEND COUPON FOR GED-3877 CONTAINING MORE INFORMATION ON PRODUCTIVE PURCHASING

GENERAL ELECTRIC COMPANY
SECTION 666-3
SCHENECTADY 5, N. Y.

Please send me GED-3877

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

CHECK LIST for a BEARING BUYER

PRODUCT — BEARINGS, BUSHINGS AND SPECIAL PARTS OF CAST BRONZE OR SINTERED METALS ALCOA® ALUMINUM BARS

FIRM NAME — *The Bunting Brass and Bronze Co., Toledo 1, Ohio*

	YES	NO	REMARKS
Are its products available from stock?	✓		Readily
Do local distributors have stocks?	✓		All over America
Cast Bronze Bearings	✓		866 sizes
Sintered Oil-filled Bronze Bearings	✓		667 sizes
Cast Bronze 13" Bars	✓		267 sizes
Sintered Oil-filled Bronze 6½" Bars	✓		84 sizes
Aluminum 13" Bars	✓		138 sizes
Is it a high quality product?	✓		Bunting 72 Bronze Alloy (SAE 660) Alcoa Aluminum
Are stock sintered bearings made to ASTM Standards?	✓		Always
Any restrictions on quantity?		✓	Small lots at big run prices
Does it render extraordinary service in emergencies?	✓		Large reserve facilities
Does it have ample production capacity?	✓		Two large modern plants
Is the range of stock sizes complete?	✓		Meets every usual need
Does the company publish catalogs?	✓		See below
Does it publish technical data?	✓		In all catalogs and in special literature
Does the company make products to blueprint?	✓		Over 50,000 patterns for customer free use
Does it give competent engineering aid?	✓		It's free
Is the company well established?	✓		Over 50 years



CATALOG 258 lists Electric Motor Bearings.

BAR CARD 40 lists 138 sizes of Bunting Bearing Aluminum 13" Bars.

CATALOG 58 lists Bunting Cast Bronze and Sintered Oil-filled Bronze Bearings and Bars.

BUNTING'S "ENGINEERING HANDBOOK ON POWDER METALLURGY" details manufacture and use of sintered metal bearings and parts.

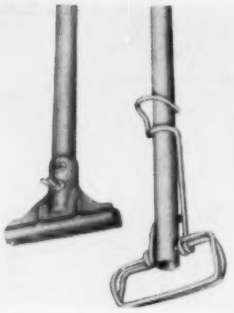
Write for Catalogs or ask your Distributor

Bunting® local distributors are listed in classified section of telephone directory under "BARS-BRONZE" or "BEARINGS-BRONZE"

For More Information Write No. 240 on Inquiry Card—Page 32

Products

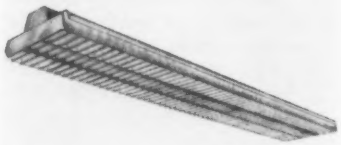
Durable, Lightweight Aluminum Mop Handles



Mop handles of durable lightweight aluminum are 22% lighter than wood. Weighing only 21 oz., they are ideal for jobs where women are employed. Handles are finished in a hard gray anodized luster which resists chipping and scratching. Ends are capped to avoid damage to walls and woodwork. Available with clamp-type jaws or springless solid-grip jaws, in 54 and 60 in. lengths. **Fuller Brush Co., Ind. Products Div., 88 Long Hill St., East Hartford 8, Conn.**

Write No. 36 on Inquiry Card—Page 32

New Fixture for Extra-High Illumination



A new commercial lighting fixture is designed for use in offices, drafting rooms and semi-industrial areas where extremely high lighting levels are required. 19 in. wide "area of light" assures superior, high-level lighting. Two-lamp unit produces 30,000 lumens of illumination, permitting use of fewer fixtures to produce a given amount of light. Fixture may be pendant-mounted individually or in continuous rows. Rigid steel louvers are held by safe yet simple snap-locks. **Smithcraft Lighting, Chelsea 50, Mass.**

Write No. 37 on Inquiry Card—Page 32

NAME YOUR SPECIAL HOSE REQUIREMENT

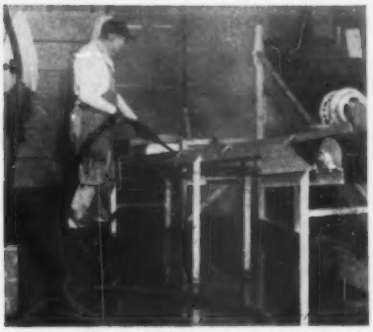
Quaker Thermoid makes it...makes it serve you longer!



Welding Hose Single and double line types for welding and flame cutting operations. Flame and oil resistant. Meets specifications of International Acetylene Association.



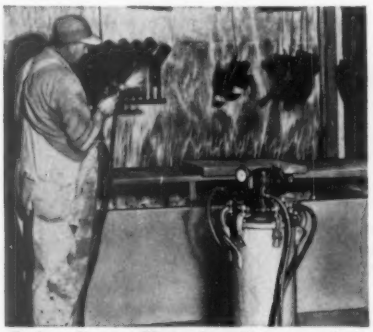
Fire Hose Strong, lightweight, extremely flexible and mildew resistant. Ideal for plant fire protection where acids, alkalies and hydrocarbons ruin ordinary hose.



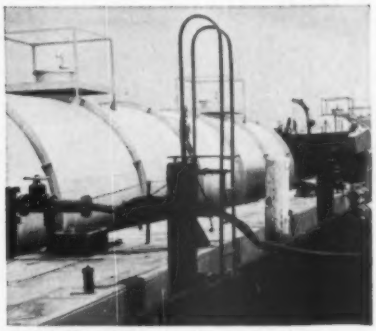
Steam Hose Wide range of sizes and types for all steam service applications up to 150 lbs. pressure and temperature to 368° F. Ten-to-one safety margin against bursting.



Tank-Truck Hose Constructed to withstand a wide range of petroleum products and hydrocarbon chemicals including aromatic fuels, in either suction or discharge service.



Paint Spray Hose for all types of air operated lacquer and paint spraying equipment. Special lacquer and paint resistant tube, reinforced with braided rayon.



Acid Hose Grades for conveying even the most corrosive acids in general industrial applications as well as chemical, steel, fertilizer and acid manufacturing plants.



Hydraulic Hose Flexible, high pressure hose, for use with hydraulically operated equipment such as jacks, riveting machines, lubricating equipment and die casting machines.



Water Hose Grades for both light and heavy-duty suction and discharge service. Sturdy yet lightweight, flexible yet built to withstand full vacuum.

Are you using the proper grade and type of hose for every job in your plant? Do you have special requirements that your present hose can't take? Well, just name it . . . Thermoid-Quaker makes it . . . makes a grade or type designed specifically for every condition to give you the economy of long-lasting performance. And, your Thermoid-Quaker distributor knows how to help you select the *right* grade or type for every job. Call him or write to *Thermoid Division, H. K. Porter Company, Inc., Tacony & Comly Streets, Philadelphia 24, Pennsylvania.*

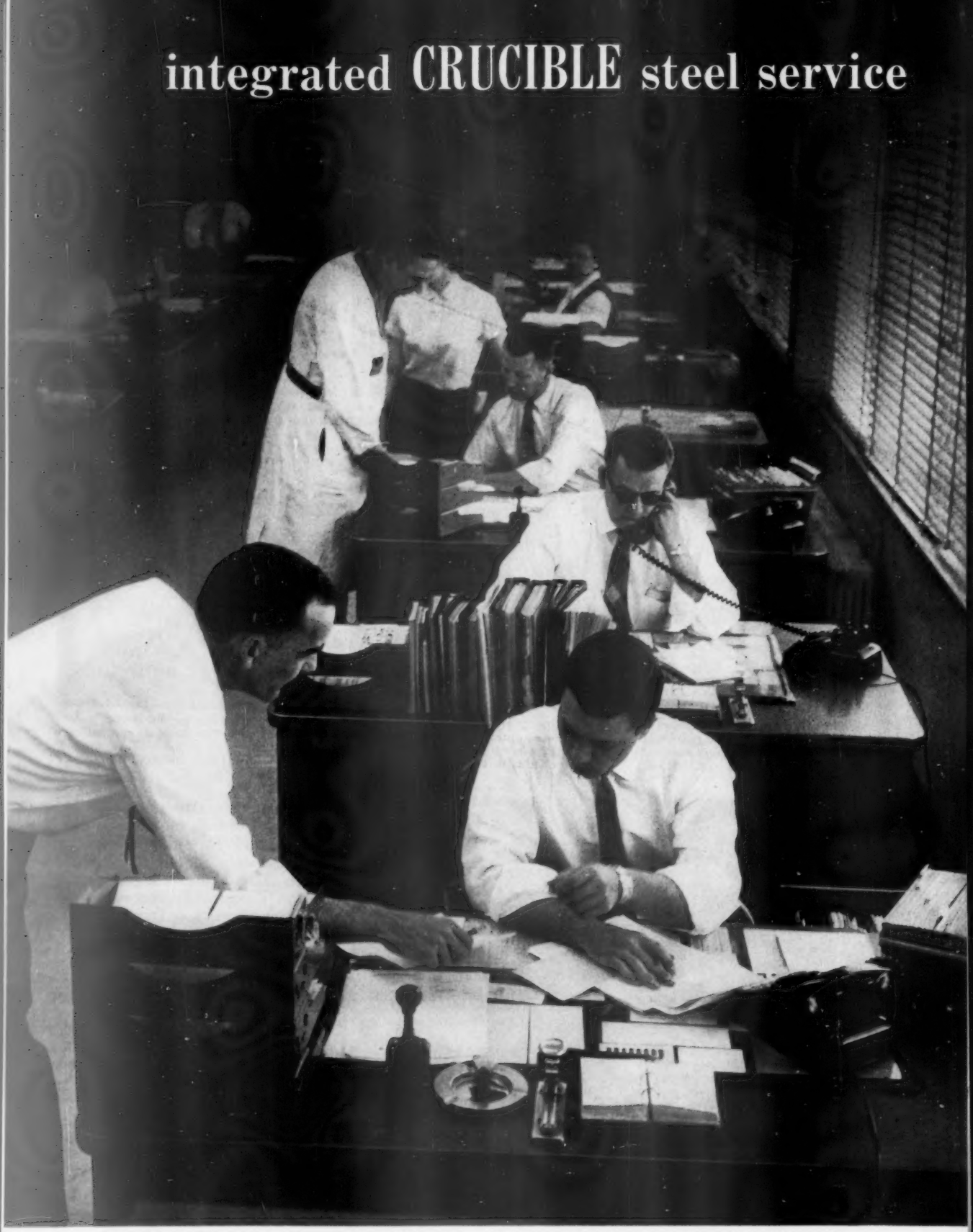
THERMOID DIVISION PORTER **H.K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; PEERLESS ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools "Federal" Wires and Cables "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD.

For More Information Write No. 241 on Inquiry Card—Page 32

For More Information about ad on following page Write No. 242 on Inquiry Card—pg. 32→

integrated CRUCIBLE steel service



Crucible inside account salesmen (1) simplify ordering and expedite deliveries of the steels you need, (2) arrange for handling extra services, (3) supply you with basic steel and metalworking data.

staffs 32 local warehouses with specialized personnel to solve your specialty steel problems

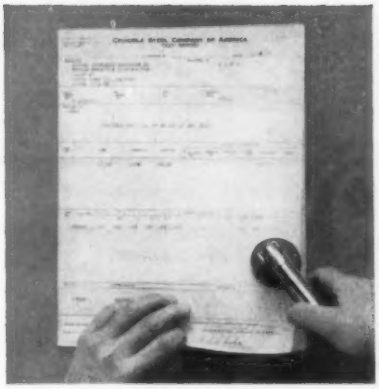
"We frequently rely on Crucible warehouse people," says one of our good customers. "We've found they can sometimes show us more economical steels, sizes and methods than those we're using. Furthermore, they give us valuable help with steels we're using for the first time."

This steel buyer, like thousands of others, believes in getting services with the steels he buys. Here's what he gets:

Crucible inside account salesmen help him simplify ordering, speed up his deliveries. They can efficiently arrange for extra services, such as forging, slitting, grinding and polishing, because of their special training at Crucible mills.

Crucible sales-service engineers give their production and toolroom people valuable metalworking assistance. They'll recommend machining speeds and feeds, quenching temperatures, the best forming and joining methods.

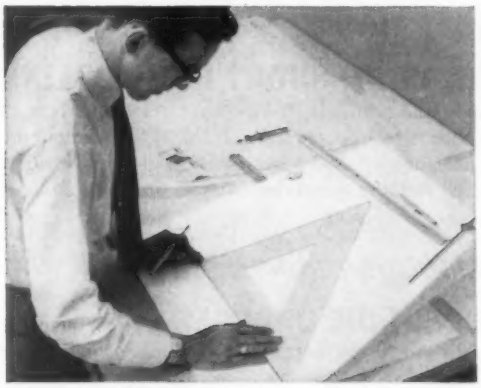
Behind these specialists are the resources of Crucible's entire, integrated operation – from mining the ore to steelmaking to warehouse delivery to you. Why not take advantage of these services each time you order specialty steels? They're available through every Crucible warehouse. *Crucible Steel Company of America, Dept. PL13, The Oliver Building, Mellon Square Pittsburgh 22, Pa.*



Need certified test reports for government work? Warehouses can supply the steels and notarized reports of analyses.



Trained, experienced sales-service engineers can help your engineers use steels that are new to you.



This is the easiest way to arrange for forging, flame-cutting — have the warehouse accommodations service do it for you.

STOCK LIST
Keeps you up-to-date on local stocks of specialty steels. Just ask the Crucible salesman to place your name on the regular mailing list.

One Source For All These Steels

TOOL STEELS–Water, oil, air hardening, shock resisting, hot work, plastic and die casting steels in all forms, including bars, sheets, plates, drill rod, hollow bars, forgings and flat ground stocks

HIGH SPEED STEELS–Crucible's famous "Rex"® steels: Rex Thrift Finish rounds, hot rolled and cold drawn flats and squares, drill rod, forgings, sheets, plates, and tool bits

STAINLESS STEELS – Bars, sheet, strip, wire, cold heading wire, metalizing wire, plates, angles

FREE MACHINING STEELS – Crucible Max-el® rounds, hexagons, plates and brake die steel

ALLOY STEELS – Bars, billets, strip and sheet

COLD ROLLED CARBON SPRING STEELS

DRILL STEELS – Hollow and solid drill steels

ALUMINUM EXTRUSION DIE STEELS

HOLLOW TOOL STEEL

HARD FACING ROD

PLASTIC MOLD STEELS

PERMANENT MAGNETS

– and many others

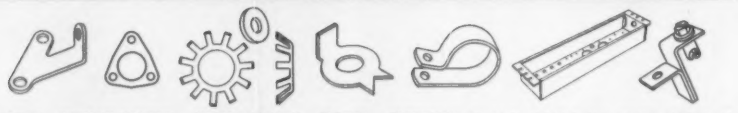
CRUCIBLE STEEL COMPANY OF AMERICA

Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Columbus • Dallas • Dayton Denver • Detroit • Erie, Pa. • Grand Rapids • Harrison • Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • New Haven • New York Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • Salt Lake City • San Francisco • Seattle • Springfield, Mass. • St. Louis St. Paul • Syracuse • Tampa • Toledo • Tulsa • Toronto, Ont.

For Stampings *Standard*...
For Stampings *Right*...
Or Stampings *Special*...
The Price is *Light*...

3

Use Any Of Our



BRACKETS METALLIC GASKETS SPECIAL WASHERS CLAMPS ELECTRONIC CHASSIS BRAZED AND BENCH ASSEMBLIES

Now you can be sure...with a nationally-known stampings *service*... in *your* area...experienced, factory-trained *sales engineers* available for consultation...for stampings in quantities *one to a million*...with the advantages of *better quality, faster delivery and lower costs.* Here's how it's done:

I

A FEW PIECES—at Experimental or Pilot Stage

NO DIES! Our *"One Plus" Method,* applying custom-built slitters, cutters, notching dies, slotting dies, bending tools and stock punches—PLUS special techniques and skills—produce these small quantities at very low cost.

II

SHORT RUNS

LOW-COST, SHORT RUN TOOLING!
This Method produces something more than a few, but less than high production quantities. Simple contour dies, special purpose presses keep costs 'way low. Newly expanded facilities speed deliveries.

III

PRODUCTION RUNS

MODEST DIE CHARGES on larger quantities! Here is where our regular *Production Tooling Method* applies to advantage...to deliver high quantity Stampings, and at lowest possible unit cost.

Free 12-page booklet *Service in Stampings* shows how to save. Write for it.

Our service checks your requirements against our 3 methods...one is sure to work out best for you—and your budget. Let us quote your next job...including brazing, welding and assembly, if desired.

STAMPINGS DIVISION
"One Piece or a Million"

LAMINATED SHIM COMPANY, INC.
...on most Bid Lists
2412 UNION STREET, GLENBROOK, CONN.



METALLIC GASKETS • ELECTRONIC CHASSIS
WASHERS **STAMPINGS** SPACERS
BY LAMINATED SHIM CO. SPECIALISTS
CLAMPS • BRAZED and BENCH ASSEMBLIES

For More Information Write No. 243 on Inquiry Card—Page 32

Products

New Portable Barrel and Drum Dumper



A new barrel and drum elevating and dumping unit features 2000 lb. capacity, portability, and electric drive with automatic and inching control plus remote control station. Unit can elevate drums of machine parts and dump them into work surfaces, handle acids, oils and other supplies received in hard-to-handle containers. Drums or containers from 18 in. diameter up to standard 55 gal. drum size are held firmly in place. Caster-mounted unit is portable even fully loaded; floor lock prevents motion during dumping cycle. **Jarke Mfg. Co., 6333 W. Howard St., Chicago 48, Ill.**

Write No. 38 on Inquiry Card—Page 32

Drill and Power Screwdriver in One



A new double-purpose tool combines the properties of a drill and power screwdriver. As a drill the new tool can be used with all kinds of bits, including twist drills up to ⅜ in., wood augers to ¾ in., masonry bits up to ½ in. and hole

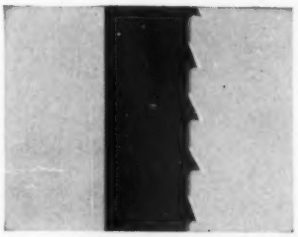
(*Please turn to page* 142)



Carbide Tipped Saws. These outstanding saws are precision-crafted by Disston to maintain their keen cutting edges 30 to 50 times longer than ordinary steel saws. The carbide tips are brazed (not silver soldered) under the most rigid controls to insure maximum strength. Packaged in special protective reusable containers to insure safe shipment and storage. Made in all popular styles and sizes to fill the needs of the wood, plastic, and metal cutting trades.

quality in cutting edges that counts with industry

Whatever your customers' needs, you can satisfy them with Disston's quality cutting tools. They're expertly crafted in complete lines to tackle any job and do a better job of it. Also, Disston backs you up with consistent national trade advertising. And remember, it's Disston's policy to sell through industrial distributors. Write for Disston tool catalogs to *Disston Division, H. K. Porter Company, Inc., 246 Tacony, Philadelphia 35, Pa. In Canada, Box 530, Acton, Ont.*



Hard Edge Flexible Back Band Saws. *Lancer tooth* is specially designed with a 10 degree positive hook and uniformity of set to enable each tooth to produce a fully formed chip. This positive rake cuts much faster than standard skip tooth blades . . . resulting in economical, high-speed production cutting of non-ferrous metal, plastic and wood. *Regular pattern* bands supplied in both Raker and Group tooth set for ferrous metals.



Machine Hack Saw Blades. Disston's complete line includes: High Speed Steel for precision-cutting of tool steels and high abrasive steels; Di-Mol, a high speed all-hard blade with maximum toughness, for general shop work where it's necessary to take abuse, and nest-cutting is required; Super Safe High Speed Steel Welded Blades . . . tough, shatterproof . . . withstand heavy strains or feeds at maximum operating speeds. Available from stock in all popular lengths and tooth spacings. Also available for hand use in 10″ and 12″ length.



Philbrick Generated Knife Type Head. You don't have to throw part of the knife away with this cutter head. Knives sit down in the head body so that they can be ground much further back. And they hold just as firm when worn as when new . . . maintaining their pattern for life. One set of head bodies can be used with different sets of knives for a variety of patterns.



Dissteel Thin Planer Knife. Specially designed dense high chrome steel knife for cutting soft abrasive woods. Turns out a better quality product at lower cost. Stays sharp longer between grinds. Runs longer between jointings. Takes care of 75% of all types of planing.

DISSTON DIVISION PORTER **H.K. PORTER COMPANY, INC.**

PORTER SERVES INDUSTRY: with Rubber and Friction Products—THERMOID DIVISION; Electrical Equipment—DELTA-STAR ELECTRIC DIVISION, NATIONAL ELECTRIC DIVISION; Specialty Alloys—RIVERSIDE-ALLOY METAL DIVISION; Refractories—REFRACTORIES DIVISION; Electric Furnace Steel—CONNORS STEEL DIVISION, VULCAN-KIDD STEEL DIVISION; Fabricated Products—DISSTON DIVISION, FORGE AND FITTINGS DIVISION, LESCHEN WIRE ROPE DIVISION, MOULDINGS DIVISION, H. K. PORTER COMPANY de MEXICO, S. A.; and in Canada, Refractories, "Disston" Tools, "Federal" Wires and Cables, "Nepcoduct" Systems—H. K. PORTER COMPANY (CANADA) LTD

For More Information Write No. 244 on Inquiry Card—Page 32

For a money-saving balance

between maximum performance and moderate cost . . .

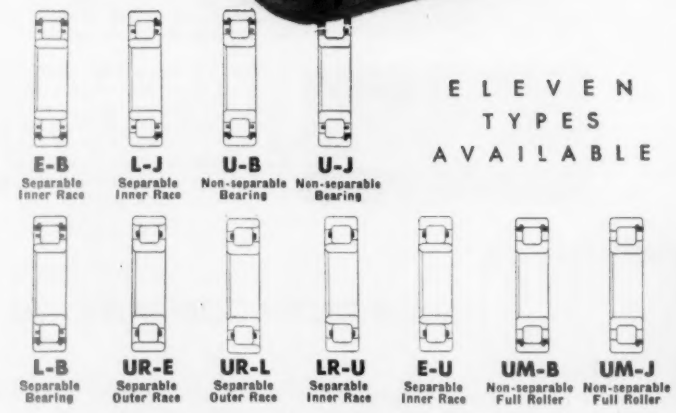


ROLLWAY Tru-Rol® BEARINGS

Give you more for your bearing dollar

For those hundreds of in-between applications where performance requirements are more exacting than those provided by the ordinary commercial bearing, but where maximum precision would be unneeded precision – specify Tru-Rol for the job.

Tru-Rol Bearings provide above-commercial-grade efficiency . . . at worthwhile savings in cost. Internal clearances are closely controlled. Rollers are equally spaced to eliminate out-of-balance vibration. Each roller is crowned to distribute the load evenly along the full length of the roller. Eleven types available in single and double width bearings, in stamped steel retainer, segmented retainer or full roller construction.



ELEVEN TYPES AVAILABLE

Ask your nearby Rollway Service Engineer to detail the quality you *should be getting* in your "commercial grade" bearings. Or write for the Rollway Tru-Rol catalog showing the full line, and capacity and size ranges. ROLLWAY BEARING COMPANY, INC., Syracuse, N. Y.

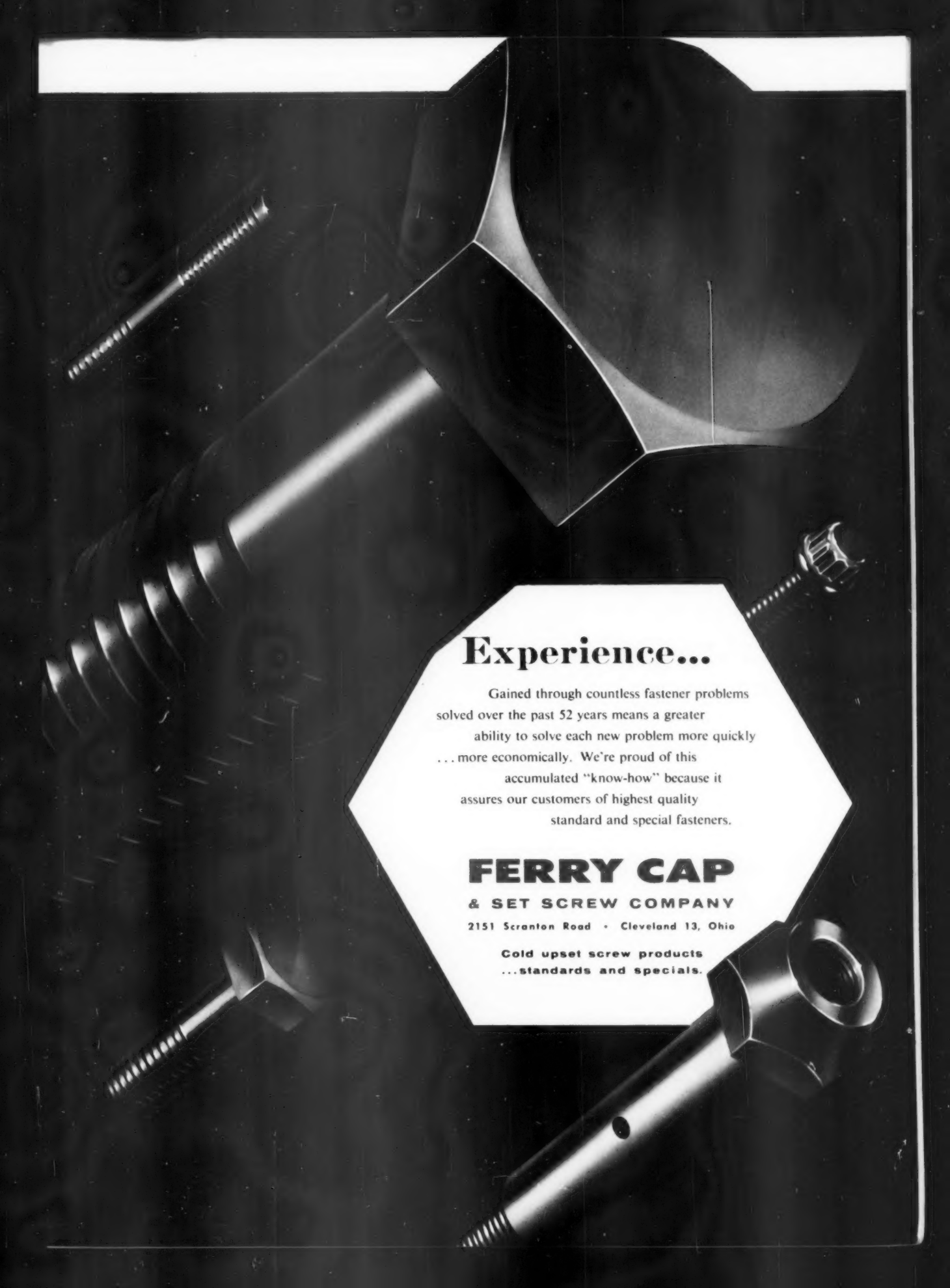
ROLLWAY® BEARINGS

COMPLETE LINE OF RADIAL AND THRUST CYLINDRICAL ROLLER BEARINGS

ENGINEERING OFFICES: Syracuse • Chicago • Toronto • Cleveland • Seattle • San Francisco • Boston • Detroit • Pittsburgh • Houston • Philadelphia • Los Angeles

For More Information Write No. 245 on Inquiry Card—Page 32

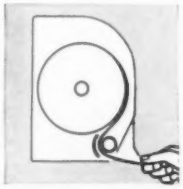
For More Information about ad on facing page Write No. 246 on Inquiry Card—pg. 32→


Experience...
Gained through countless fastener problems solved over the past 52 years means a greater ability to solve each new problem more quickly ... more economically. We're proud of this accumulated "know-how" because it assures our customers of highest quality standard and special fasteners.
FERRY CAP
& SET SCREW COMPANY
2151 Scranton Road • Cleveland 13, Ohio
Cold upset screw products
...standards and specials.



Steiner controlled towel dispensers

Cut washroom costs three ways



HOW IT WORKS: Towels are in roll. User pulls towel down and tears up. Control mechanism turns roll so another towel is ready for next user. Result: every user gets enough towels but there is no waste.

First: You'll save with Steiner Company controlled paper towel dispensers because *controlled* dispensing cuts towel waste . . . as much as 20 per cent. Second: You'll reduce washroom maintenance costs because cabinet holds about 500 towels . . . coupled with waste cutting, this means supply lasts longer and cabinet has to be refilled less frequently. Third: You can reduce your inventory and free valuable storage space for other supplies. Reason: A case of Steiner roll towels is the same size as a case of folded . . . yet it holds twice as many towels.

Your local janitorial supplier or sanitary paper distributor can help you . . . there is no charge for the dispensers. For free literature please write to Steiner Company, 740 Rush St., Chicago 11, Ill.

STEINER

STEINER COMPANY

740 RUSH STREET, Dept. C-12, CHICAGO 11, ILLINOIS

For More Information Write No. 247 on Inquiry Card—Page 32

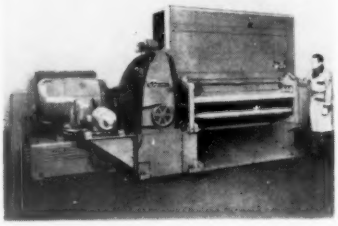
Products

(*Continued from page* 138)

saws from 5/8 to 1¾ in. A simple turn of the spindle collar converts it to a power screwdriver, with a true screwdriver clutch. Bit idles for finding screwhead slot, then forward pressure engages the mechanism. As soon as screw is properly seated, release of driving pressure disengages the clutch and prevents marring of surface. **Black & Decker Mfg. Co., Towson 4, Md.**

Write No. 39 on Inquiry Card—Page 32

New Automated Sheet Polishing Mills



New sheet polishing mills provide a continuous automated method for performing abrasive belt-finishing operations. Mills will handle metal sheets and plate from 3 ft. long and up as well as coils at feeds from 20 to 60 fpm. Typical standardized units are made to handle stock widths of 30, 50, 54 or 74 in. Features include large-diameter heavy-duty pinch rolls, worm gear pinch roll drives, idler roll stabilizers, all outside adjustments, and adjustable sheet pressures. **Acme Mfg. Co., 1400 E. Nine Mile Rd., Detroit 20, Mich.**

Write No. 40 on Inquiry Card—Page 32



". . . . Doesn't keep any inventory records, has it all up here."

MT. VERNON DIE CASTING ENABLES FOREMOST TO UNDERSELL ELECTRIC CAN-OPENER MARKET



CASE HISTORIES FROM MT. VERNON FILES

Subject:
Foremost Appliance Corp., BROOKLYN, NEW YORK

The big reason why this quality can-opener can sell for far less than all its competitors: it was designed expressly to simplify assembly by utilizing all of die casting's unique advantages—high strength-to-weight ratio, great flexibility of shape, inherent reproducibility, high production rate, clean finish and high degree of dimensional accuracy.

The result is an intricate integral casting that contains, among other details, bearing wells for motor drive shaft and reduction gears, along with bosses to mount the heavy-duty, high-speed motor and gear train. There are no bearing alignment problems, because the casting is extremely strong...able to hold critical tolerances despite its light weight and compactness.

The casting also contains bosses for back-panel mounting, recessed cam actuator channel, switch actuator guide pins, switch mounting guide, slots and perforations for the sliding face plate, front and bottom air vents, and switch-limiting post projecting from the trim, modern face. These rigid, rugged castings are supplied trimmed and machined, with switch slot and mounting holes already punched. 12 secondary assembly operations were thus eliminated from the prototype.

Mt. Vernon's experienced four-fold service helped solve Foremost's challenge in record time...an 11th hour challenge to have their product in stores in time for Christmas selling. First...designing the many cost-saving features into the casting—second, making the extremely intricate, extremely precise dies, with nameplate inserts—third, utilizing their huge, modern die-casting facilities for lower-cost quantity runs of more perfect castings—and fourth, complete machining facilities for on-time delivery of clean castings ready for baked-enamel finishing and assembly.

Mt. Vernon's coordinated four-fold services are under one roof—in 200,000 sq. ft. of space...ready to help you produce a finer product through the unique benefits only die-casting offers. A call to your nearest Mt. Vernon representative—for information or assistance at any phase—may also help you solve the problem of how to undersell your competitors. He'll be glad to talk it over. Call him today.



MT. VERNON
DIE CASTING CORP.
STAMFORD, CONNECTICUT

RESEARCH PARTICIPANT

SALES REPRESENTATIVES

BALTIMORE, MD.: Mr. C. M. Gordan, 919 St. Paul St.
BROOKLYN, N. Y.: Mr. Robert V. Moore, 2317 Plumb 2nd St.
CLEVELAND, OHIO: Mr. Grant Eller, 6 East 194th St.
GUILDERLAND, N. Y.: Mr. David H. King, 75 Willow St.
PITTSBURGH, PA.: Mr. Andrew W. Anderson, 300 Pasadena Drive So.
QUINCY, MASS.: Mr. Edmund W. Libby, 31 Merrymount Rd.
ROCHESTER, N. Y.: Mr. William Sauers, 101 Briarcliff Rd.
SKANEATELES, N. Y.: Mr. Jerome J. Theobald, 9 E. Genesee St.
STAMFORD, CONN.: Mr. Anker Anderson, Cascade Road
VALLEY FORGE, PA.: Mr. G. T. McMaster, P.O. Box 115

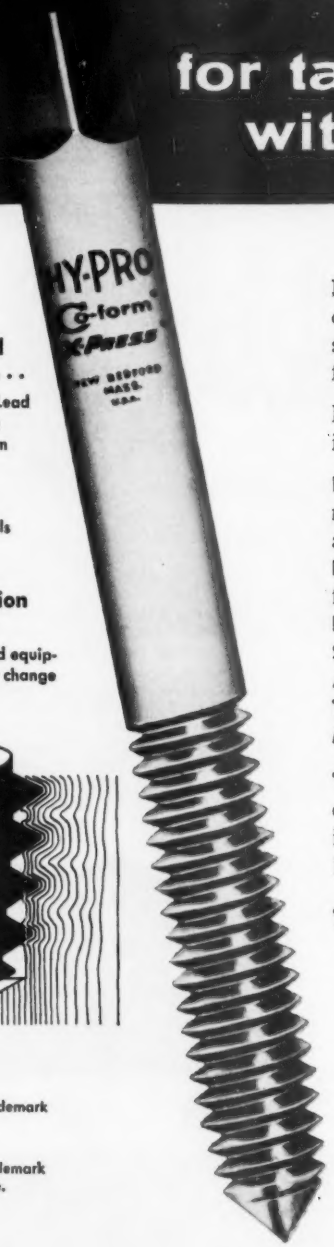
For More Information Write No. 248 on Inquiry Card—Page 32

Announcing **HY-PRO**

Co-form® X-PRESS® TAPS

Manufactured under license from Besly-Welles Corporation

for tapping threads without cutting



Recommended for tapping . . .

Copper Brass Lead
Aluminum Zinc
Steel Magnesium
Die Castings
Leaded Steel
Stainless Steel
— other ductile metals

Tapping operation is the same

Conventional methods and equipment are used, except for change to larger tap drill sizes.



NOW — from HY-PRO you can get the newest in tap design — Co-form X-PRESS fluteless taps that are setting cost-reduction records on many jobs that were formerly "tap-killers".

HY-PRO Co-form X-PRESS taps cold-form threads in through or blind holes, with these advantages . . .

No Chips to clog and cause tap breakage — no chip removal problems • **Permit Faster Tapping Speed** and boost production from automatic equipment **Provide Accurate Control** of hole size — cannot be forced into lead error • **Eliminate Blind Hole Tapping Problems** — no chips to jam at bottom • **Form Stronger Threads** with better holding power • **Taps Are Stronger** without flutes, especially in smaller sizes **Taps Last Longer** and maintain accurate size tolerance **More Holes Per Tap** — up to 40 times greater tap life.

Try HY-PRO Co-form X-PRESS taps on your toughest tapping operations. For complete application information, call your HY-PRO Distributor or write: HY-PRO Tool Company, New Bedford, Mass.

Tap for less with Co-form® X-PRESS®

For the complete line of HY-PRO standard taps from stock, call your local HY-PRO Distributor.



® Co-form is a registered trademark of Hy-Pro Tool Company.

® X-PRESS is a registered trademark of Besly-Welles Corporation.

HY-PRO TOOL COMPANY
NEW BEDFORD, MASS., U. S. A.

For More Information Write No. 249 on Inquiry Card—Page 32

THE USES OF VULCANIZED FIBRE'S INHERENT TOUGHNESS

by Earl A. Russell, Chief Engineer, Spaulding Fibre Company, Inc.

The toughness of Vulcanized Fibre often contributes uniquely to meeting crucial requirements of an application as well as to making possible low cost fabrication. For example a vulcanized fibre kickback plate in a bowling alley makes effective use of its built-in toughness while in an automobile starter switch the toughness of fibre permits swaging a supporting bushing to fit the switch case.

What die casting does in reducing the cost of odd shaped parts in metals, swaging does with vulcanized fibre. In addition to being tough enough to readily withstand punching operations, it is also sufficiently plastic to permit swaging to shape. In this particular swaging operation the fibre is compressed in some areas and flowed into raised areas to form a shank fitting into the hole and a shoulder fitting the contour of the starter switch case (Fig. 1).

In the assembly the sturdy switch contacts are economically mounted and fully insulated with vulcanized fibre, taking advantage of the toughness of the fibre parts to provide adequate support against the impact of entering switch contacts.

It may be noted further that combined with the toughness to withstand punching and the plasticity to permit swaging into low cost parts, vulcanized fibre provides the required electrical insulation.

In the bowling alley application (Fig. 2) wood could not take the beating from the pounding blows of the pins as they smash against the partitions that separate the alleys. For protection of the wooden partition, the toughness of vulcanized fibre is required to withstand the repeated blows from the pins. At the same time the fibre must be sufficiently plastic to avoid damaging the pins yet resilient enough to provide acceptable rebound for desirable pin action.

Fibre performs these unusual functions through years of service at surprisingly low cost.

In railroad track insulation, athletic protective parts, gaskets for high pressure systems, switch parts, electric motor parts and formed parts for many applications, the toughness of fibre combines with other important properties to provide a simple part which performs two or more functions with good results and low cost.

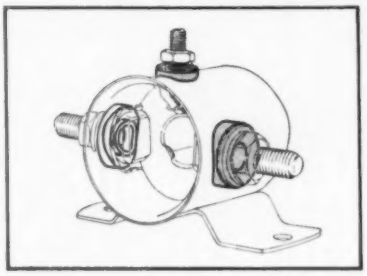


FIGURE 1. A complex shape difficult to machine by ordinary methods, this vulcanized fibre bushing is swaged and punched in one operation to produce a low cost part to meet strict requirements of toughness. Supporting heavy duty contacts under repeated shock loads, the bushing also insulates the contacts against the surrounding case.

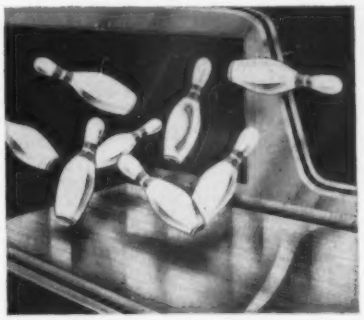


FIGURE 2. Tough vulcanized fibre kickback plate absorbs the impact of the flying pin without damage to the pin or the partition. The rebound action, so necessary to top scores, is possible because of the resiliency of the fibre.

FREE

A NEW 12-PAGE REFERENCE BOOK FOR YOUR DESIGN FILE

Devoted exclusively to complete engineering data on Vulcanized Fibre. Send for your copy today.



SPAULDING FIBRE COMPANY, INC.
333 Wheeler Street
Tonawanda, New York

Please bring my engineering file up-to-date by sending a free copy of Spaulding's "Vulcanized Fibre Engineering Data"

Name_____ Title_____

Firm_____

Address_____

City_____ Zone_____ State_____

For More Information Write No. 250 on Inquiry Card—Page 32



Now–two kinds of

CAMPBELL SLING CHAINS

.....FACTORY-MADE

.....CUSTOMIZED

Campbell offers Factory-Made and Customized Sling Chains . . . both with the same strength and working load limits!

CAMPBELL Factory-Made SLING CHAINS

Available in all styles from Campbell's three strategically located plants. In three grades: Cam-Alloy, Wrought Iron, High Test Steel. Campbell Certificates of Test issued for your safety. Write today for Catalog S-558.

CAMPBELL Customized SLING CHAINS

You can order slings assembled by Campbell distributors or at Campbell factories and warehouses from pre-tested components. Or you can assemble slings right on the job. In single or double types, Alloy grade. Certificates of Test issued for complete assemblies or components. Write today for Catalog CSA-1.

CAMPBELL CHAIN

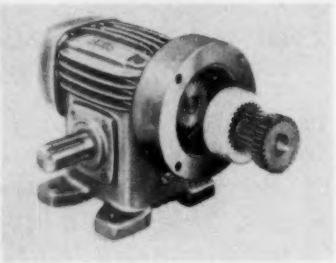
CAMPBELL CHAIN *Company*

FACTORIES: York, Pa.; West Burlington, Iowa; Alvarado, Calif.

WAREHOUSES: E. Cambridge, Mass.; Seattle, Wash.; Portland, Ore.; Atlanta, Ga.; Dallas, Texas; Chicago, Ill.; Los Angeles, Calif.

Products

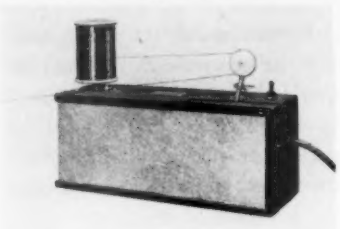
Speed Reducers with "C" Flange Mountings



Fin and fan cooled speed reducers in a new line are equipped with "C" flange motor mountings. One style permits direct connection of motor shaft to reducer's input shaft. The other style is equipped with a bell-shaped flange which allows enough room to accommodate a flexible motor coupling between the drive motor and the input shaft of the reducer. Available in complete range of sizes from 1.32 in. to 5.25 in. center distance, in ratings from 1/16 to 18 HP. **Ohio Gear Co., 1400 E. 179th St., Cleveland 10, Ohio.**

Write No. 41 on Inquiry Card—Page 32

Automatic Control in Spooling Operations



A new, precisely regulated unit is designed to spool and un-spool fine gauge material, providing constant predetermined tension, with negligible error, through a wide range of speeds. It is especially effective in winding of electron tube grids, resistors, solenoids, potentiometers and similar operations. AC motor, simple yet, precise control unit, a unique sensing device and automatic brake make up unit, which is housed in a 12¾ x 14-13/16 x 8-11/16 in. anodized aluminum cabinet. **Diehl Mfg. Co., Somerville, N.J.**

Write No. 42 on Inquiry Card—Page 32
For More Information Write No. 251
←on Inquiry Card—Page 32

ESPECIALLY AS A FLEET VEHICLE . . .

THIS IS THE YEAR OF THE LARK

289 STATE, CITY AND COUNTY GOVERNMENTS have chosen The LARK for greatest economy and dependability—from public health nurse to police and emergency cars.

604 NATIONALLY KNOWN COMPANIES of top-rank business stature have chosen The LARK—for low-cost transportation with prestige and comfort.

276 RENTAL AND LEASING OPERATORS across the country are buying LARKS—they continue to buy because operating, insurance and maintenance costs average 30% less than with standard-size low price cars.

76 TAXICAB FLEETS are averaging 12.6% increase in profits with the built-for-the-purpose Studebaker "Econ-O-Miler" taxi—the most ruggedly built Heavy Duty passenger car in the country.



THE NEW DIMENSION IN FLEET CARS—The LARK has been proven in service by more than 1,000 fleets across the country Reports come in every day on The LARK at work—"One cent less per mile on 150 LARKS, against the Big Three cars we use"—"One third better gas mileage, 20% saving on oil"—"Better riding than larger cars used in the past"—"Our drivers are buying LARKS for their own cars" *Against all competition, this is the Year of The LARK!*

BUDGET-WISE BUYERS

LOVE THAT

LARK

BY STUDEBAKER

TELL US MORE ABOUT LARK SAVINGS!

Fleet Sales Division, Studebaker-Packard Corp., South Bend 27, Indiana

( ) Send us informative literature only

( ) Have a factory representative call me for an appointment

NAME_____

PLEASE PRINT

TITLE_____

COMPANY_____

ADDRESS_____

P12-7-59

For More Information Write No. 252 on Inquiry Card—Page 32


ANOTHER IN A SERIES
OF MOTOR FACTS
FROM ALL INDUSTRIES

"Roughest duty we have ever seen motors endure"

reports Marquette Iron Mining Co. of the Westinghouse Life-Line "A" motors in its Eagle Mills Pelletizing Plant

Operating continuously, 24 hours per day, dependable Westinghouse Life-Line® "A" motors drive a network of fans and conveyors at the Eagle Mills Pelletizing Plant of Marquette Iron Mining Co., Ishpeming, Michigan.

Some of these motors are located directly above a sintering machine where ambient temperatures often exceed 200° F and the motor is subjected to deposits of finely divided iron ore. Under these conditions, not a single motor breakdown or failure has occurred during 11 months of service.

Says Mr. Ed Gagnon, plant electrician, "Our Westinghouse motors have given us complete reliability on the roughest tests we have ever seen a motor endure."

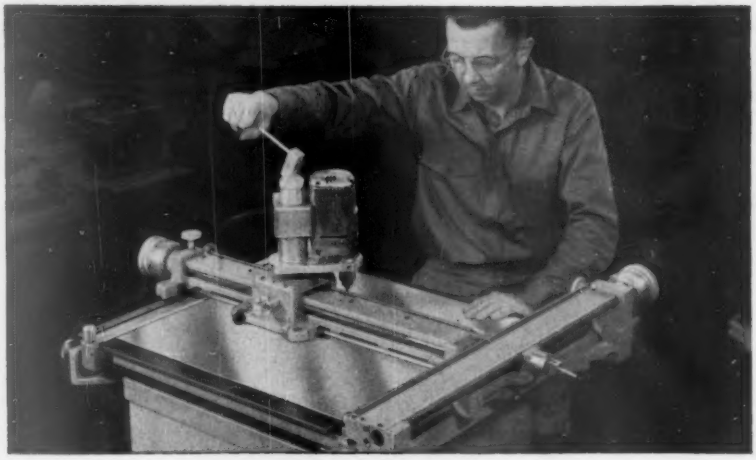
For specific information about the ways your operation can benefit from the improved performance, longer life and reduced maintenance offered by the dependable Life-Line "A," contact your nearby Westinghouse sales engineer. Or write to Westinghouse Electric Corporation, P.O. Box 868, 3 Gateway Center, Pittsburgh 30, Pennsylvania. J-22077

YOU CAN BE SURE... IF IT'S
Westinghouse



Deposits of powdered iron ore are no problem to this 2-hp Life-Line "A" motor driving conveyor which carries powdered iron ore to the balling disc where ½" pellets are formed. Presealed, prelubricated Life-Line "A" bearings keep dirt and other material out.

layout and template making time cut in half...



THE NEW STRIPPIT FLEX-O-DRILL

- **DRILLS, REAMS, SCRIBES, CENTER PUNCHES** to ± 0.002" WITHOUT base line drawing or height gauge layout!
- **EASY, ACCURATE POSITIONING**—quickly set to any reference point and to nearest 0.100" by adjustable steel tapes reading in both directions from zero. Micrometric gauges then bring settings to nearest 0.001". No optical scanning device needed.
- **LASTING ACCURACY!** Table is an actual ground surface plate. Bridge assembly is of heavy, accurately machined castings. Lead screws are precision ground and engaged only during micrometric gauge settings to minimize wear. All parts are corrosion-resistant. Bearings are protected against dust and chips by felt shields. Drill motor is heavy-duty industrial type.
- **¼" CAPACITY** in mild steel — stock up to 24" width, any length.
- **ALSO A PROVEN MONEY-SAVER** on pilot runs, low unit production.



Template drilled by Flex-O-Drill | *Layout scribed by Flex-O-Drill* | *Flex-O-Drill work piece*

WRITE FOR LITERATURE TODAY, and an actual demonstration at your plant:

WALES STRIPPIT INC.

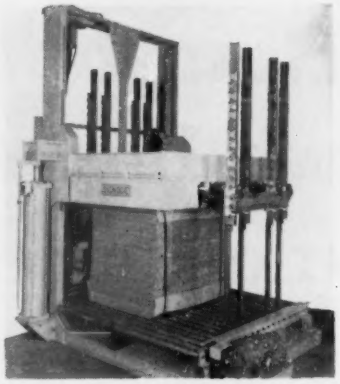
229 Buell Road, Akron, New York

In Canada: Strippit Tool & Machine Company, Brampton, Ontario

For More Information Write No. 254 on Inquiry Card—Page 32

Products

Fully Automatic Compression Strapping Machine



A new compression strapping machine is fully automatic, simplifying, automating and speeding up steel strapping operations. Sturdy machine compresses the load, feeds, tensions, and seals the strap in seconds. Finished bales are compact and easily stacked, taking up less space in storage or in shipment and arriving in excellent condition. Machines are available with platen pressures from 6000 to 16,000 lbs., with choice of either pneumatic or hydraulic systems. **Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.**

Write No. 43 on Inquiry Card—Page 32

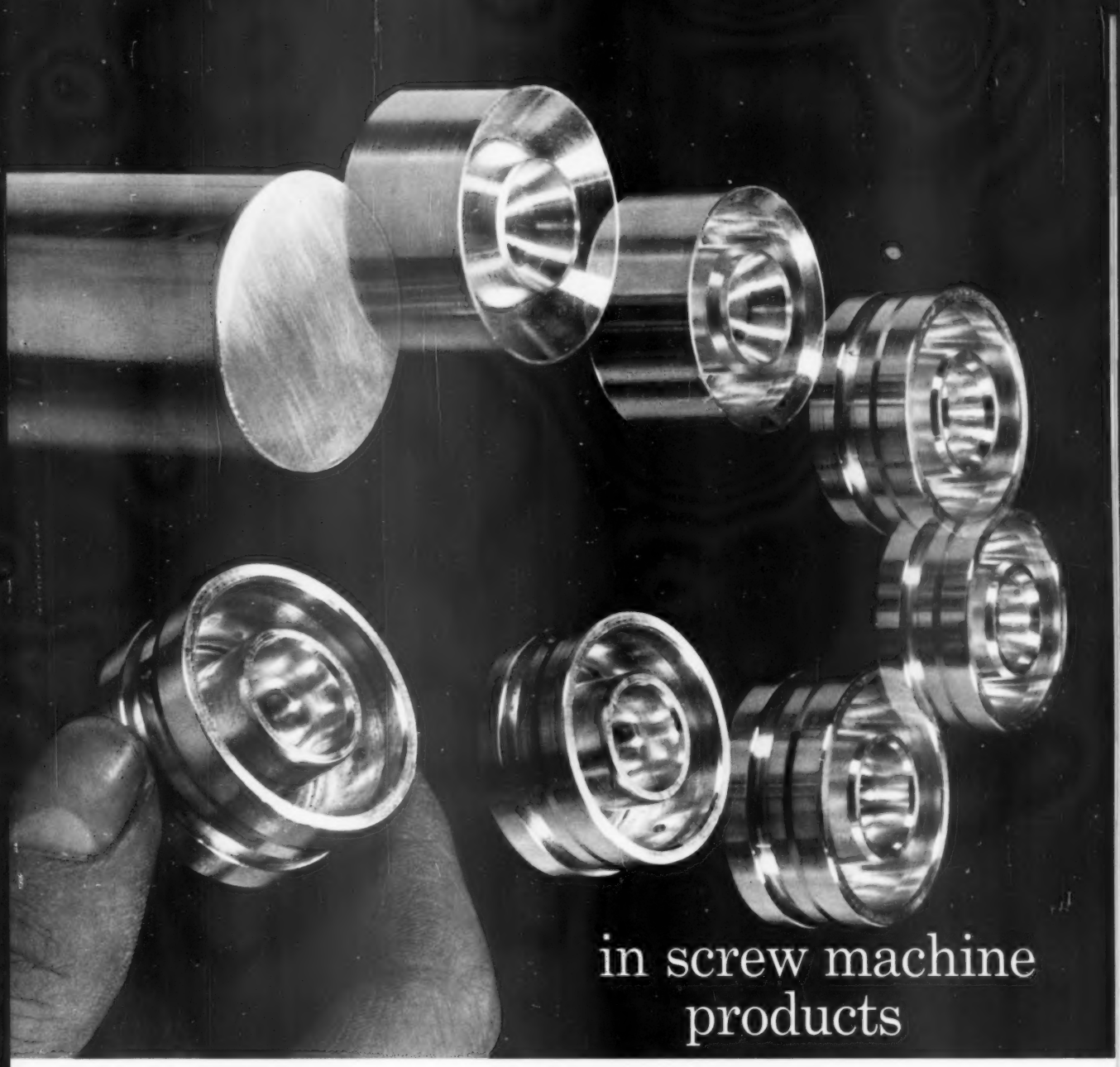
Heavy-Duty, Multiple Spindle Drill Head



A heavy-duty multiple spindle drill head provides nine driving stubs (one a center stub) and has maximum capacity of nine ⅝ in. drills in mild steel. Maximum center distance of spindles is 7-⅜ in.

(*Please turn to page* 155)

For More Information about ad on facing pg. Write No. 255 on Inquiry Card—pg. 32→



Alcoa puts the metal where you want it

This aluminum piston for an automotive air-conditioning compressor shows how far Alcoa goes to put the metal where you want it. Not just in primary screw machine operations, complex and demanding as they were, but on through a series of exacting secondary operations that enabled us to deliver a completely finished part.

Using 1 7/16-in. diameter 2014-T4 cold finished bar on a six-spindle automatic, we handled the forming, trepanning, drilling, facing and counterboring. Then we tackled the rest of the job—drilling and deburring two 1/16-in. cross holes. This was followed by coining the ball seat at a specified tonnage in order to insure proper assembly without distortion. Centerless grinding was then performed to a total tolerance of half a thousandth of an inch (plus or minus 0.00025 in.). All finished? Not by our standards. After final inspection, we cleaned every piece and packed it with meticulous care to prevent damage in transit, insuring safe and sound arrival.

Whether it's screw machine parts, forgings, castings, extrusions or impacts, Alcoa can put the metal where you want it—precisely and economically. The payoff may be fewer rejects, new flexibility in design, less waste in production, a best-selling product—or all four. To draw on Alcoa's file of ideas and Alcoa facilities, write today: Aluminum Company of America, 920-K Alcoa Building, Pittsburgh 19, Pa.

Alcoa puts the metal where you want it—in castings, forgings, impacts, extrusions and screw machine parts.

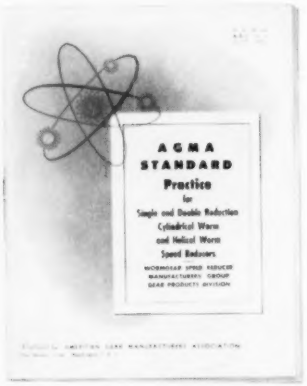
ALCOA ALUMINUM

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

Your Guide to the Best in Aluminum Value

DE LAVAL offers new A.G.M.A. Gear Standards Booklet for Engineers

You will not want to be without this newly published American Gear Manufacturers Association booklet. It outlines the new standards for single and double reduction cylindrical worm and helical worm speed reducers.



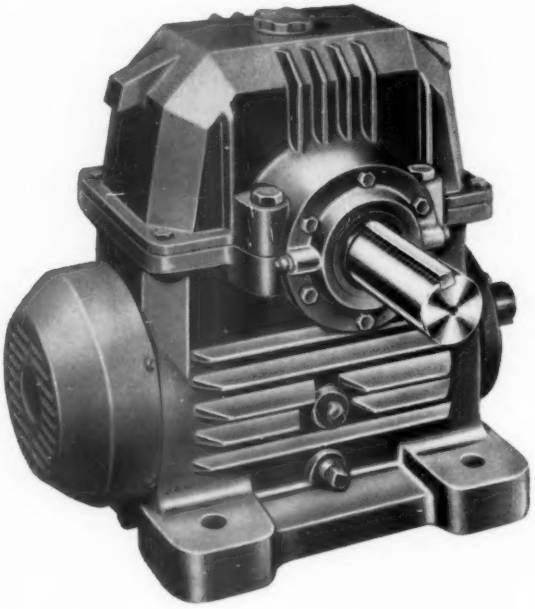
Get this new A.G.M.A. 440.03 booklet free of charge by request on your company letterhead.

This new standards booklet contains important design data including: Power rating of worm gears • Ratio correction factor (Km) • Materials factors (Ks) • Velocity factor (Kv) • Coefficient of friction(μ) • Thermal factor • Service factors • Efficiency • Overhung load capacity • Lubrication.

The materials factor (Ks) and the coefficient of friction (μ) are new, reflecting the latest advances made in worm gearing in the past few years.

We have also recently published our new Delroyd Worm Gear Sets Catalog 3800 and Delroyd Single Reduction Worm Gear Catalog 3805, which contain comprehensive information on the selection of these units.

De Laval furnishes worm gearing under the trade name DELROYD and has a complete line from 1⅛" to 36" center distance, in horsepower ranges from .04 to 700 and in ratios from 5: to 4900:.

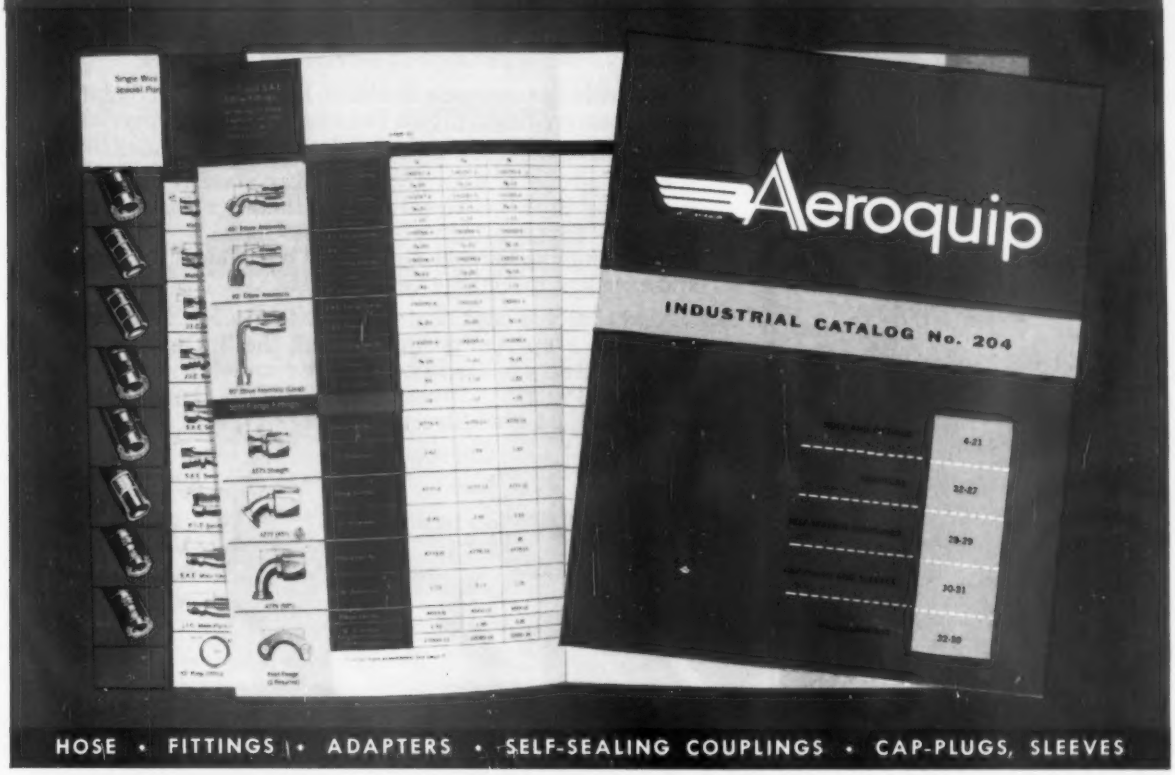


DE LAVAL *Steam Turbine Company*

807 NOTTINGHAM WAY, TRENTON 2, NEW JERSEY

DL-482

NEW! Aeroquip Catalog Gives Specific Product Data You Need for Effective Fluid Line Replacement



HOSE • FITTINGS • ADAPTERS • SELF-SEALING COUPLINGS • CAP-PLUGS, SLEEVES

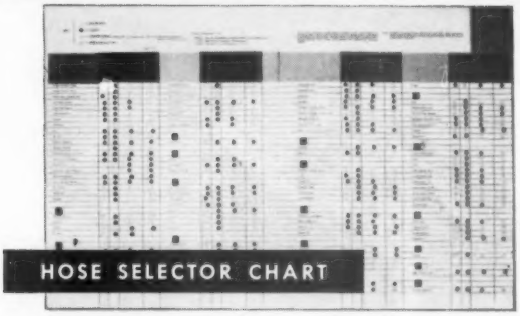


Chart shows you how to select the *right* hose lines to meet *your* precise needs!

Here is finger-tip-convenient information for purchasing agents and maintenance engineers working with fluid-carrying lines. This brand-new catalog presents clear, complete information on easy-to-assemble Aeroquip Hose Lines and Reusable Fittings.

High-quality Aeroquip products are available through factory-selected and approved distributors everywhere. These men are thoroughly qualified to provide expert advice and fast delivery of your hose line requirements. See the "Hose" classification in your Yellow Page phone book.

For your ADVANCE copy of this new catalog, fill in coupon—mail TODAY!

Aeroquip

AEROQUIP CORPORATION, JACKSON, MICHIGAN

P-12

Aeroquip Corporation, Jackson, Michigan
Please RUSH me a copy of new Industrial Catalog No. 204

Name_____

Title_____

Company_____

Street Address_____

City_____ Zone____ State_____

For More Information Write No. 257 on Inquiry Card—Page 32

Panelyte®
LAMINATED SHEET, TUBE & ROD
is as near as your telephone!

A wide range of NEMA and military grade laminates—copper-clad, as well as sheet, tube and rod in a variety of shapes and sizes—is available in St. Regis PANELYTE. A nationwide network of distributors and fabricators backed by St. Regis warehouses gives you the fastest service you ever saw!

St. Regis has complete stocks of PANELYTE in Trenton, Chicago, Denver, Seattle, San Francisco and Los Angeles—near enough to provide overnight service to practically any location.

Every grade of PANELYTE is being steadily improved by continuing St. Regis research. And there's a PANELYTE grade for every purpose—high dielectric strength, low moisture absorption, minimum cold flow under high humidity conditions and excellent machining characteristics.

Next time you need laminated plastics in NEMA or military grades—pick up your phone and call the St. Regis source of supply nearest you. Or write now for complete details and specifications: PANELYTE Division, Box P-1259 St. Regis Paper Company, 150 East 42nd Street, New York 17, N. Y.

St.Regis PANELYTE®



For More Information Write No. 258 on Inquiry Card—Page 32

—and here's where to call the PANELYTE distributor nearest you!

ALABAMA
*Marine Specialty Company
Mobile, Alabama

ARIZONA
Electrical Specialty Company
Phoenix, Arizona

CALIFORNIA
Cadillac Plastics
Los Angeles, California
Electrical Specialty Company
Los Angeles, California
Cadillac Plastics
San Francisco, California
Electrical Specialty Company
San Francisco, California

COLORADO
Electrical Specialty Company
Denver, Colorado
*Regal Plastic Supply
Englewood, Colorado

CONNECTICUT
Modern Plastic & Glass Company
Bridgeport, Connecticut
*New England Non Metallics Co., Inc.
Milford, Connecticut
Industrial Safety Supply
W. Hartford, Connecticut

DELAWARE
Brandywine Fibre Company
Wilmington, Delaware
Kaufman Glass Company
Wilmington, Delaware

FLORIDA
Commercial Plastics
Miami, Florida

GEORGIA
AAA Brands Plastic Supply Co.
Atlanta, Georgia

ILLINOIS
Cadillac Plastics
Chicago, Illinois
Colonial Kolonite
Chicago, Illinois
Insulating Manufacturing Corp.
Chicago, Illinois

INDIANA
*Hyaline Corporation
Indianapolis, Indiana

KANSAS
The Henry Company
Wichita, Kansas

LOUISIANA
Drake-Thompson and Company
New Orleans, Louisiana

MARYLAND
Gilbert Plastics and Supply Company
Baltimore, Maryland

MASSACHUSETTS
Plastic Supply Co. (Hub Stamping)
Boston, Massachusetts
*Insulation Products Company
Chicopee, Massachusetts
H&P Spool & Bobbin Company
Lawrence, Massachusetts
*Laminated Sheet Products
Norwood, Massachusetts

MICHIGAN
Cadillac Plastics
Detroit, Michigan

MINNESOTA
Arrowhead Plastics
Minneapolis, Minnesota
Service Tool & Engineering
Minneapolis, Minnesota

MISSOURI
Cadillac Plastics
Kansas City, Missouri
Plastic Sales
Kansas City, Missouri
Cadillac Plastics
St. Louis, Missouri

NEW JERSEY
*Insulating Fabricators, Inc.
East Rutherford, New Jersey
Allied Plastics Supply Corporation
Elizabeth, New Jersey
*Insulating Specialties, Incorporated
Hillside, New Jersey
Kennedy Lumber Company
Trenton, New Jersey
*Rummel Fibre Company
Union, New Jersey

NEW MEXICO
*Jay-Grear, Incorporated
Albuquerque, New Mexico

NEW YORK
*T. J. Long, Incorporated
Carle Place, New York
*Aircraft Specialties Company, Inc.
Hicksville, New York
Allied Plastics Supply Corporation
New York City, New York
Commercial Plastics
New York City, New York
*Comco Plastics
Ozone Park, New York
The Plastic Center
Rochester, New York
*The Frank Products Corporation
Westbury, New York

NORTH CAROLINA
*Engineered Plastics, Incorporated
Gibsonville, North Carolina

OHIO
Cadillac Plastics
Cincinnati, Ohio
Cadillac Plastics
Cleveland, Ohio
Dayton Plastics, Incorporated
Columbus, Ohio
Dayton Plastics, Incorporated
Dayton, Ohio

OKLAHOMA
Denton's Glass & Plastics
Oklahoma City, Oklahoma

OREGON
Electrical Specialty Company
Portland, Oregon

PENNSYLVANIA
Commercial Plastics
Philadelphia, Pennsylvania
*Herschel Engineering & Supply Co.
Philadelphia, Pennsylvania
Commercial Plastics
Pittsburgh, Pennsylvania

TEXAS
A&A Supply Company
Dallas, Texas
Cadillac Plastics
Dallas, Texas
Cadillac Plastics
Houston, Texas

WASHINGTON
Electrical Specialty Company
Seattle, Washington

WISCONSIN
Rahrs Engineering
Manitowoc, Wisconsin
Cadillac Plastics
Milwaukee, Wisconsin

***Distributor-Fabricators who can give special attention to your fabrication needs.**

St.Regis PANELYTE®

Products

(*Continued from page* 150)

with minimum center distance of 1 in. When used for multiple hole tapping, unit has a capacity of nine ½ in. taps in mild steel. Rugged construction with many accessories available. Drill head has 1:1 gear ratio and is recommended for speeds to 2500 rpm. **Cleveland Pneumatic Industries, 64 Old Orchard, Skokie, Ill.**

Write No. 44 on Inquiry Card—Page 32

New Spring Uses Liquid Compressibility



A new spring using liquid compressibility produces 40,000 pound force on ¼ in. strokes in a self-contained package only 2½ in. in diameter and 5 in. long. In addition, an interior shock absorber action may be added without changing the overall dimensions. Shock absorbing force is available up to 60,000 lbs. or 15,000 inch-pounds of energy absorption. The spring rate is 120,000 lbs. per inch of deflection. Standard mounting method is stud 1 in. long, but other mountings are available. **Taylor Devices, Inc., 188 Main St., North Tonawanda, N.Y.**

Write No. 45 on Inquiry Card—Page 32

Mold Release Oil for Die Casting

A newly developed mold release oil is designed to meet the special requirements of the die casting industry. New oil has improved mold release properties, prevents adhesion of casting metal to the die mold, gives stain-free casting surfaces, and produces die cast-

(*Please turn to page* 158)

ALMAG 35



INGOT

UTMOST DIMENSIONAL STABILITY*

Almag 35 is a high purity aluminum-magnesium alloy possessing exceptional dimensional stability properties, which fully assure the finest castings with all the following advantages:

- High strength
- High shock resistance
- High corrosion resistance
- High ductility
- No age hardening
- Superior machineability
- Takes high polish
- As cast without heat treatment no locked up stresses

Covered by U.S. Patents 2564044, 2568179, 2628899, 2764482, 2568180, 2584772, 2733991 and 2583473. Do not accept substitutes.

ASK FOR BULLETIN No. 354

WILLIAM F. JOBBINS INCORPORATED

P. O. BOX 230
AURORA • ILLINOIS

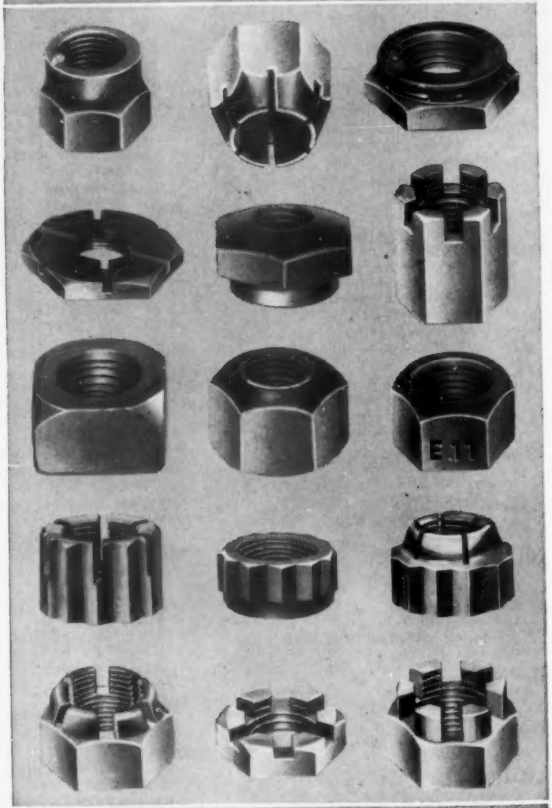
*Stabilization at 700°F provides absolute stress relief without loss of properties or machineability.

For More Information Write No. 259 on Inquiry Card—Page 32

SPECIAL NUTS

to specs. 7/16"—4 1/4" cross flats

special machines + large stock of material x years of experience = speedy deliveries high quality low prices



Here are a few samples made to customers specifications . . Our batteries of special high-speed multi-spindle, automatic machines make possible fast and accurate production of hexagon nuts of non-standard height and special shape from carbon or alloy steel, Naval bronze or other non-ferrous metals; also AN 310 through AN 335 as per latest Airforce specifications. Very often the special nut you require may be similar to one we are already making and a simple modification would result in a price advantage and quicker deliveries to you . . Send us your blueprint and particulars —let us quote on your requirements . . We also have a catalog that contains complete specifications, engineering data and prices regarding our standard nuts.

Manufacturer of Standard and Special
12 Pointer, Square and Hexagon Nuts
..."Huglock" and "Conelock" locknuts.

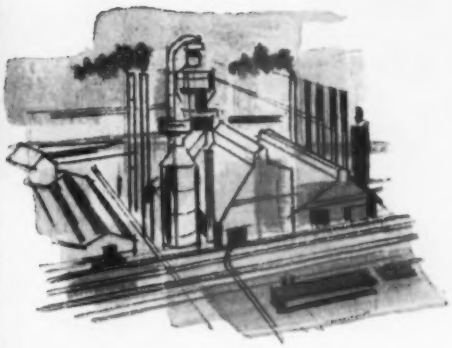
NATIONAL MACHINE PRODUCTS COMPANY

an sps company

44250 UTICA ROAD
UTICA, MICH

For More Information Write No. 260 on Inquiry Card—Page 32





get steel mill toughness

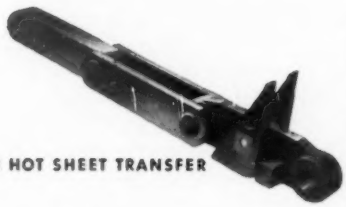
in Jeffrey chains

Starting right with selection of metals to give maximum strength with minimum weight, Jeffrey builds durability into steel mill chains. They are designed for continuous operation. Machining, heat treatment, assembly and inspection are rigidly controlled to Jeffrey's high standards.

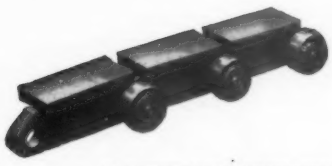
You can select Jeffrey chain and attachments for every steel mill requirement or have them tailor-made to fit the job. The Jeffrey Manufacturing Company, 784 North Fourth Street, Columbus 16, Ohio.



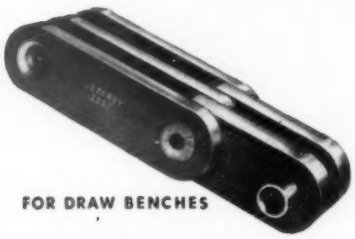
FOR CROP CONVEYORS



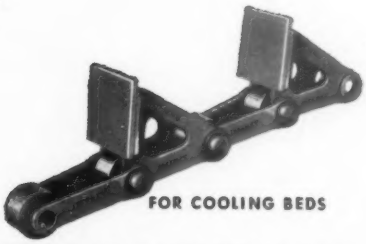
FOR HOT SHEET TRANSFER



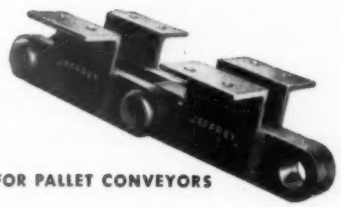
FOR HOT COIL CONVEYORS



FOR DRAW BENCHES



FOR COOLING BEDS



FOR PALLET CONVEYORS

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

For More Information Write No. 261 on Inquiry Card—Page 32



Speed work, cut costs with B&D accessories

Every job goes faster when you use the *right* tool . . . and the accessories *built for* that tool.


GRINDING WHEELS


WIRE WHEEL BRUSHES

HAMMER TOOLS

SCREW DRIVER BITS

With over 2,000 accessories in the line, you're *always* right when you buy B&D because Black & Decker has the *right one* for every application.

So remember . . . whether your need is hammer tools, screw-driver bits, wire wheel brushes, grinding wheels, polishing pads or any other accessory for a Black & Decker tool . . . call your local Black & Decker Distributor. He stocks 'em all.

50th YEAR

See Tools Electric - Yellow Pages - for Service & Sales

Black & Decker®

ACCESSORIES DESIGNED FOR THE TOOL

For More Information Write No. 262 on Inquiry Card—Page 32

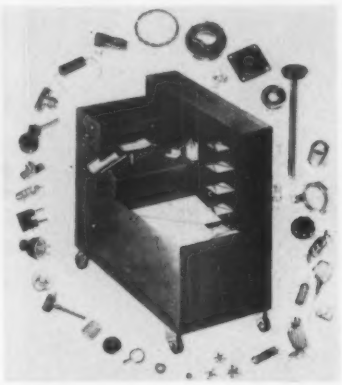
Products

(*Continued from page* 155)

ings with less porosity. Lubricant develops less fog during die casting operations and gives excellent lubrication, with less wear on guide pins and bushings. **Industrial Products Dept., Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.**

Write No. 46 on Inquiry Card—Page 32

Automatic, High Speed Parts Counter



A new automatic parts counter is a fully transistorized electronic unit that provides an accurate count at very high speeds either for packaging or for inventory. Counter is particularly designed for items which are oddly shaped or which might interlock, in sizes from ⅛ in. to 4 in. Weight limits are from 1/20th oz. to 1 lb. per part. Speeds up to 20 pieces per second are possible on small parts. Unit is mounted on wheels and may be plugged into any 115 volt, 60 cycle source. **Atronic Products, Inc., 1 Bala Ave., Bala-Cynwyd, Pa.**

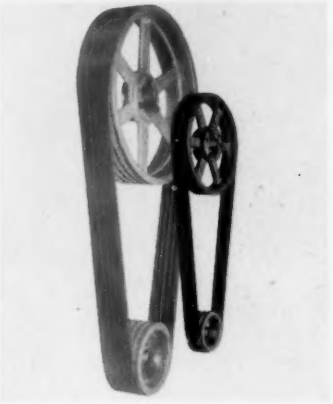
Write No. 47 on Inquiry Card—Page 32

New Press Features High Operating Speed

Presses in a new line feature a patented design that is said to step up operating speed by 80%. New press is particularly suited for deep-draw applications, because extra-long draws can be made at higher speeds than shallow draws on a standard crank-type press. Unit utilizes simple, toggle-eccentric mechanism rather than electrical, mechanical or hydraulic arrangements. Available with one-, two- or four-point suspension and for single and double action, in capacities of 200 tons and up. **Cleveland Crane and Engineering Co., Wickliffe, Ohio.**

Write No. 48 on Inquiry Card—Page 32

Compact, Extra-Strong V-Belt Drives



New V-belt drives feature compactness, made possible by high-strength belts and sheaves. Units are built to handle up to three times the horsepower of conventional drives occupying the same space. Smaller drives reduce shaft overhang, increase bearing life, cut maintenance costs and simplify inventory and storage. Overall drive dimensions are reduced by as much as 50%, weight savings amount to 25% and over, and cost savings as high as 30% can be realized. **T. B. Wood's Sons Co., Chambersburg, Pa.**

Write No. 49 on Inquiry Card—Page 32



"He'll see you now. Sorry you had to wait so long."

PRODUCTION...CONSTRUCTION...MAINTENANCE


7″ Sander-Grinder

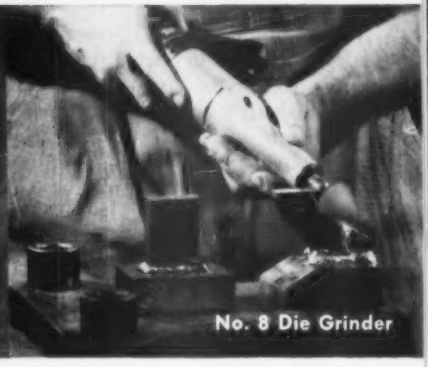

No. 12 Scrugun®


No. 11 Jig Saw

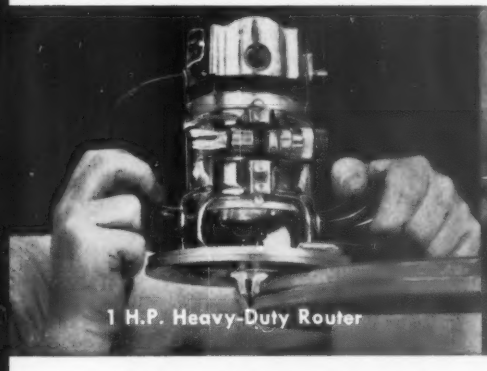
whether the job's drilling, sanding, sawing,


7″ Super-Service Saw


No. 88 Finishing Sander


No. 8 Die Grinder

or any other tool job, you'll find that


1 H.P. Heavy-Duty Router


No. 60 Portable Grinder


⅜″ Standard Holgun®

Black & Decker® Distributors help cut costs!

Save time whenever you need a portable electric tool . . . simply call your local Black & Decker distributor. He stocks over 125 tools and 3,000 accessories to give you complete selection, fast delivery, tool know-how and personal service. Or, for complete tool information mail coupon at right.

Look Under "TOOLS-ELECTRIC" in Yellow Pages

THE BLACK & DECKER MFG. CO., Dept. 1712, Towson 4, Md.

Send me information on .....

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....


☐ Tapguns®


☐ Bench Grinders


☐ Belt Sanders


☐ Hammers

Office Equipment and Supplies



An informative, 12-page **booklet** of interest to purchasing agents in all types of business has been published by **Acco Products, A Division of Natser Corporation, Ogdensburg, N. Y.** It highlights filing and binder techniques used in various offices today. Copies of the booklet are available without charge.

Write No. 50 on Inquiry Card—Page 32

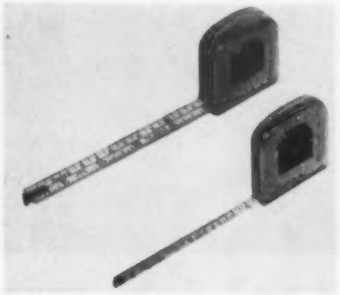


Tape splicers are now available for use wherever perforated programming paper, aluminum, Myler or other perforated tapes must be correct, repaired or changed in part. A kit, which has been introduced by **Unicorn Divison, Computer Measurements Co., 12970 Bradley Ave., Sylmar, Calif.,** consists of a small metal block with a row of small pins which fit into the feed holes of all standard tapes. The tape ends are aligned on the metal block by the feed hole pins, pushed down and smoothed out. A short piece of adhesive material with punched holes is placed over the joined ends.

Write No. 51 on Inquiry Card—Page 32

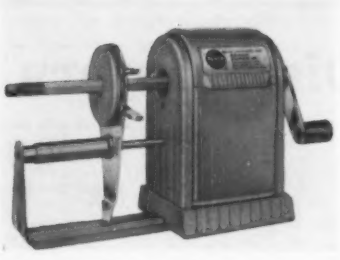
Printed in full color, the **1960 catalog of Eberhard Faber Pencil Company** includes the full line of black and colored lead pencils, ball pens, pastels, markers, crayons, erasers, and rubber bands. The new catalog has a plastic-spiral binder to permit the insertion of additional pages as new products are added to the line. This is accomplished by the aid of a plastic "insert comb" which is provided for that purpose in the catalog.

Write No. 52 on Inquiry Card—Page 32



The Executive Thin Line **rule** was recently introduced by **Flash Manufacturing Company, 169 Murray Street, Newark 5, N. J.** The new rule is .635 centimeters or ¼ inch wide and 2 meters long. The divisions are in black on white flexible steel tape. Replaceable tapes are available, permitting lifetime use of the rule. The Executive is furnished in a durable gold tone case.

Write No. 53 on Inquiry Card—Page 32



Pencil sharpeners that can be permanently fastened or sit on a mar-proof basepad have been created by **Apsco Products, Inc., P.O. Box 840, Beverly Hills, Calif.** The "Super-10" is an all-steel unit and has a specially engineered automatic feed chuck and a steel three-position adjustable stop for fine, medium, and blunt points. The new unit is available in five colors: salmon, rose, green, beige, and the standard hammerloid gray .

Write No. 54 on Inquiry Card—Page 32



Portable, full keyboard **adding machines** are now being marketed by **R. C. Allen Business Machines, Inc. of Grand Rapids, Mich.** The new line offers large print. The machines are either electrically or manually operated with six and seven column listings. It also prints minus items in red, has visible dials and automatic clear signal.

Write No. 55 on Inquiry Card—Page 32



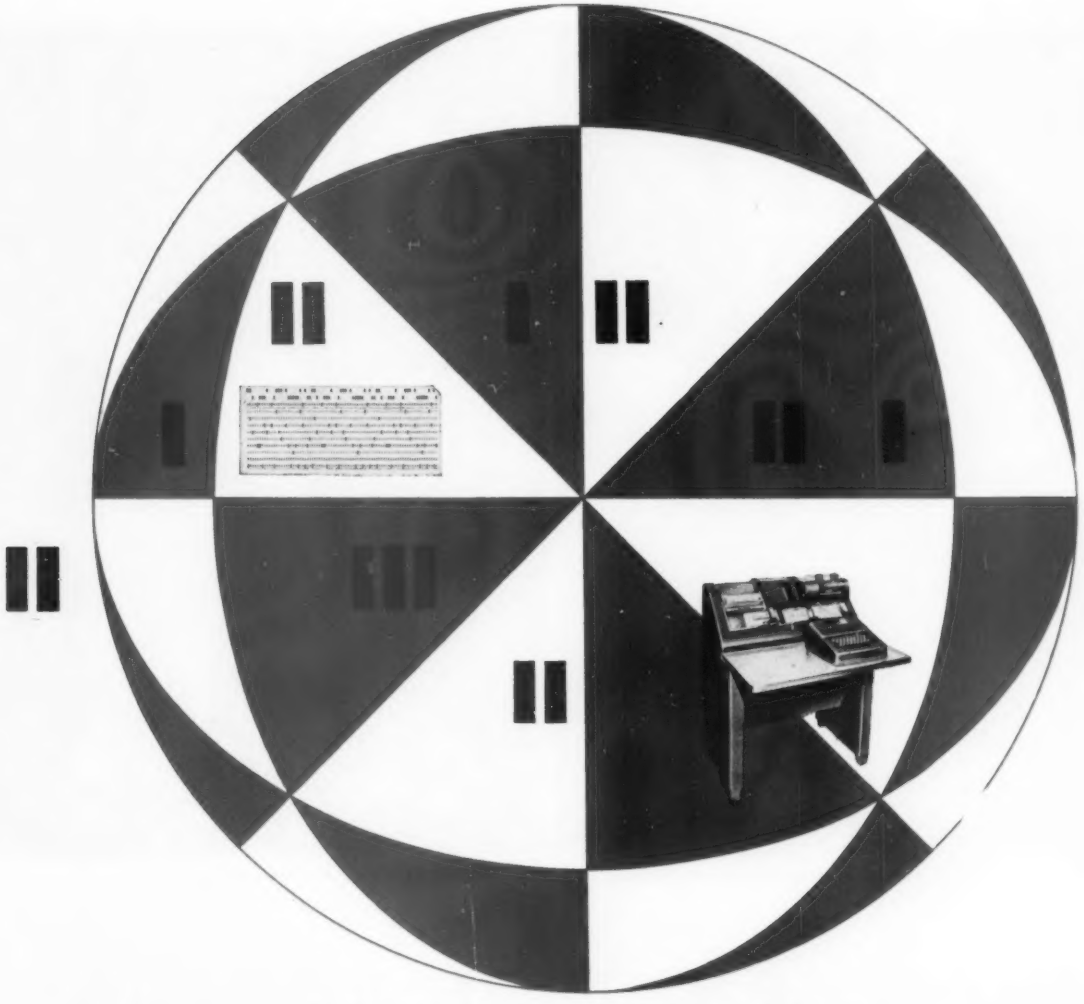
New **business card files** were put on the market by **T & H Industries, 8528 Fishman Road, Pico Rivera, Calif.** Designed of molded plastic for desktop use, the file has revolving slots for the alphabetical filing of as many as 500 cards. A twirl and pull of the selector knob on the top ejects the proper group of cards needed.

Write No. 56 on Inquiry Card—Page 32

Over forty years of experience in research, development, and manufacturing are behind the partnership in precision of IBM machines and IBM punched cards. From this experience has evolved a quality control program for the production of punched cards that is without parallel in the industry. This program assures you that every IBM punched card meets the high standards demanded of IBM equipment. It assures you, also, of continually reliable performance in your data processing operations.

IBM SUPPLIES

partners in precision



For More Information Write No. 263 on Inquiry Card—Page 32

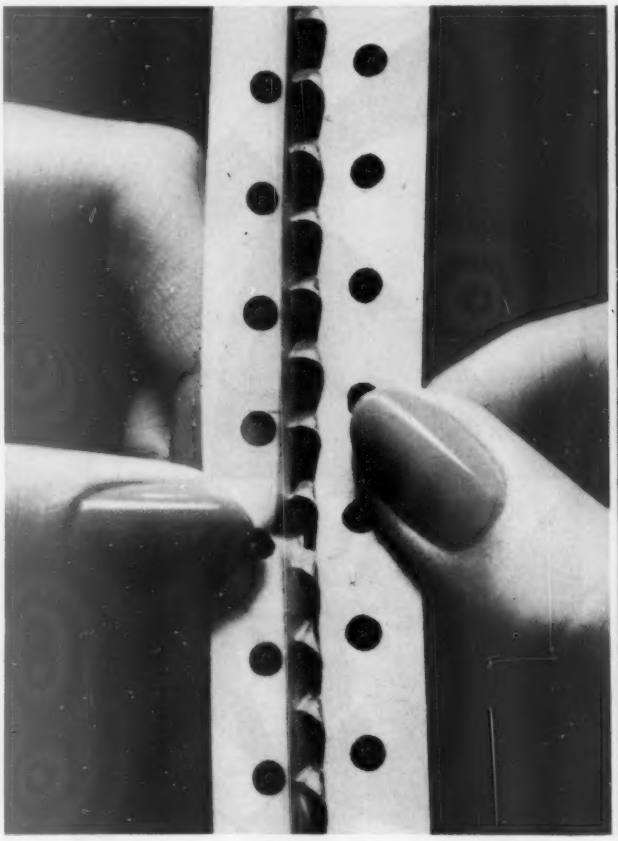
A NEW DIMENSION IN MULTIPLE PART FORMS

Moore

Speediflex is more than a new form. It is a brand new concept that gives natural forms movement to the writing and handling of continuous multiple-part forms. This revolutionary advance is due to an ingenious construction feature patented by Moore, and engineered to insure perfect part-to-part register.

Here is the Speediflex secret. The carbons are 'flex cut' for natural flow of forms. Staggered adhesive lines on either side of the flex cuts anchor the carbons as a flexible bond between the parts in the set.

The entire set of Speediflex carbons and parts is a flexible unit that feeds—naturally and in perfect alignment—around the writing platen. This does away with 'tenting' or 'peaking' at the set fold. Natural-moving Speediflex parts feed squarely on



THE SECRET OF SPEEDIFLEX — Flex cuts in carbons create new flexibility.



PERFECT REGISTER is assured at any writing speed.

Speediflex

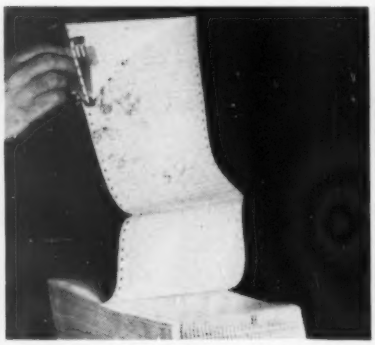
the pins to assure perfect part-to-part register at the writing point, regardless of writing speed or equipment used.

Speediflex has other writing and after-writing features that contribute to perfect feeding, perfect part-to-part register and trouble-free action. Among them . . . a new method of perforation permitting natural folding, neater packs with fast carbon extraction . . . narrow carbons that lessen bulk, for fast paper flow without creep or jam. For a summary of *all* the advantages Speediflex combines in one continuous form, call in the Moore man or write the Moore office nearest you.

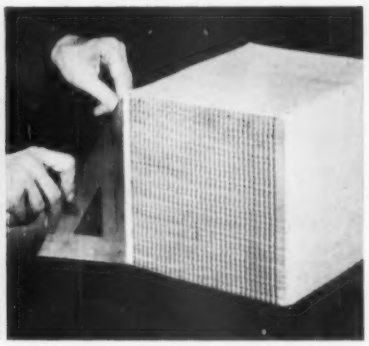
Moore Business Forms, Inc. Niagara Falls, N. Y.; Denton, Texas; Emeryville, Calif. *Over 300 offices and factories throughout the United States, Canada, Mexico, Cuba, Caribbean and Central America.*



ALL WRITING MACHINES handle Speediflex smoothly in natural, flexible movement without any tenting or peaking at the set fold.



FLEXIBILITY FOR PERFECT REGISTER makes both sides of each part move freely, floating between carbons in natural alignment.

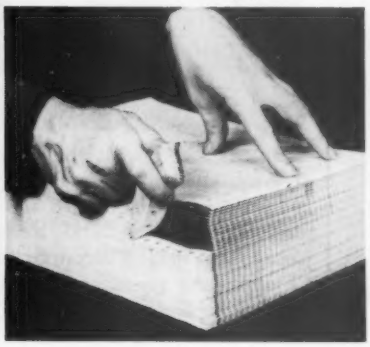


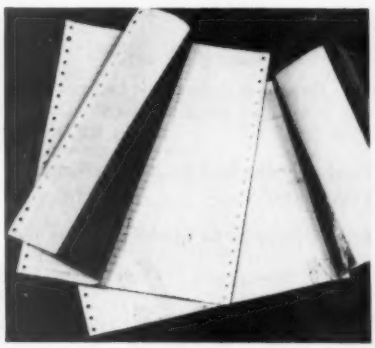
NEATER PACKS, BETTER REFOLDING—Special set perforations permit forms to fold and refold naturally into neat square packs.

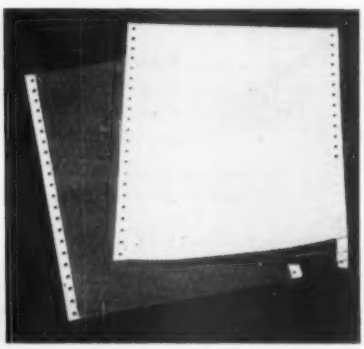
STRIP OFF MARGINS—Sensitive perforations simultaneously cut through carbons and parts, and speed stripping and decollating.

STRIP COATED CARBONS are available to eliminate unwanted data on any or all copies. Narrower carbons are also available.

SECTIONAL SETS FOR SYSTEM USE offer you one part or more loose or, if needed, two or more sets included in the full set.







Speediflex is a patented product of Moore Business Forms, Inc.

Build control with

MOORE BUSINESS FORMS

For More Information Write No. 264 on Inquiry Card—Page 32

A custom-made desk set for $375!*



The Esterbrook DESKMASTER† fountain pen desk set is instantly *custom-fitted* to any business writing task.

The secret is Esterbrook's broad selection of *32* points. Bookkeeping, clerical and carbon copies are just a few of the business points made by Esterbrook.

If a point is ever damaged, it is *instantly* replaceable! A new point threads in... in *seconds*. Costs just 60¢.

And, the DESKMASTER is attractive, *efficient*. Employees like its fine writing qualities. No wonder purchasing agents have made it the fastest selling desk set in America! (Model #112) Black and popular colors. Black, only **$3.75**

There's a precision-made Esterbrook for every business need:



Esterbrook FEED-MATIC† base desk set

Holds up to 6-month supply of ink. Reservoir in base seals ink against evaporation and dust— feeds enough ink to the point each time to write *500* words. Spill-proof.
Black, colors (Model 444). **$4.50***



Esterbrook RECORDER† ball point desk set

Writes 6 months in normal office use—A dependable ball point! Choice of ink colors, fine *or* medium point. Refills, 69¢. Deluxe Black, colors, $3.95* Black, **$2.95***

All desk sets available with chain and adhesive base for public counter use. Also doubles for use with two ink colors.

*List price per single unit. See your supplier for quotations.

Esterbrook®

†T.M. The Esterbrook Pen Co.

10-DAY FREE TRIAL—Get one of these quality Esterbrook desk sets from your regular dealer. Use it 10 days. If you aren't completely satisfied, return it to your dealer with *no cost to you.*

For More Information Write No. 265 on Inquiry Card—Page 32

Office Equipment



A completely new **standard typewriter** was recently introduced by **Olivetti Corporation of America.** Some of the new features include: the margin release key for automatic paragraph indentation and release of key pile-up; automatic or manual margin settings to determine left and right margins; four correlated scales to enable the typist to arrange layouts easily and quickly; a line-gauge to indicate the number of lines remaining on a page; and a four-position ribbon control that is said to add 30% to ribbon life.

Write No. 57 on Inquiry Card—Page 32



Offices faced with the problem of **tying stacks of paperwork** can reduce this problem with an automatic tying machine. **B. H. Bunn Company, 7605 Vincennes Ave., Chicago** has recently introduced a 16-inch and a 23-inch model. Both machines provide a double wrap cross tie. The operator places the bundle on a table, steps on a foot pedal and the machine wraps, ties and knots the bundle.

Write No. 58 on Inquiry Card—Page 32

For More Information about ad on facing page Write No. 266 on Inquiry Card—pg. 32→



New SPRINGHILL® BOND is actually whiter than clean white salt

—YET COSTS NO MORE THAN "OFF-WHITE" BONDS!

WHEN YOU FIRST see new Springhill Bond, you sense your eyes are playing tricks on you. It's so *clean white!* Then you hold a sheet to the light and you're really amazed. No watermark!

The truth is, new Springhill Bond is *measurably whiter* than salt, chalk, even surgical cotton. Actually whiter than any other unwatermarked bond paper on the market.

It's level and uniform, too. And crisp. Just try to pick up a sheet without making a crackling noise!

New Springhill Bond, Mimeograph and Duplicator are made to order for small offset duplicating presses. Every ream-wrapped package comes with a handy pull-tape opener.

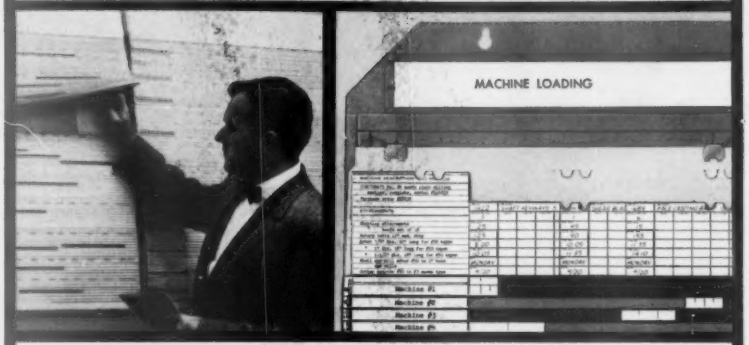
The new Springhill business papers are part of International Paper's new *first family of fine papers* packaged this convenient way. They include famous Ticonderoga Offset, Ticonderoga Text, International Ti-Opake, and Springhill Tag, Index and Vellum-Bristol. Ask your paper merchant to show you samples.



Springhill Bond comes in pull-tape junior cartons—polyethylene-lined to control humidity.

Fine Paper Division **INTERNATIONAL PAPER** New York 17, N. Y.

NEW LOW-COST WAY TO RAISE OUTPUT



Acme Visible Planning Panels make it easy to stay on top of your shop

Timing is the essence of high production at low cost. And Acme Visible Panels make it easy for you graphically to plan, schedule and follow through every job. Machine loading. Personnel assignment. Shipping. Data cards in pockets keep essential facts at your fingertips. Visible margins portray your scheduling and work progress at a glance. Send for full facts.

ACME VISIBLE

Acme Visible Records, Inc.,
8212 West Allview Drive, Crozet, Va.

Please send free booklet on production planning and control panels.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

For More Information Write No. 267 on Inquiry Card—Page 32

for restaurants, offices, and in-plant feeding...

Royal®

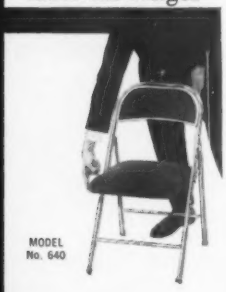
"SPACE-SAVER" SEATING
costs no more, lasts far longer



Versatile Stacking Chairs
Finished in Royal's durable Satin-Chrome or oven-baked Plastelle enamel. Graceful, comfortable—upholstered back and comfortable Flex-Spring seat.



New Cafeteria Chair
A new standard of quality, durability, beauty. Saddle seat and back are **specially** upholstered to retain shape. Satin-Chrome or oven-baked Plastelle enamel finishes.



Sturdy Folding Chairs
Exclusive "telescoping leg" design...self-opening, one-finger closing. Lightweight yet sturdy.

See Your Royal Dealer or Write for Free Literature on America's Finest Cafeteria Tables and Chairs.

ROYAL METAL MANUFACTURING COMPANY
One Park Avenue, New York 16, N.Y., Dept. 25-H

For More Information Write No. 268 on Inquiry Card—Page 32

Office Equipment



Check protectors with a built-in mechanism that automatically and simultaneously key punches the amount into IBM tab card checks have recently been introduced. Regulation IBM key punching is used in consecutive columns, and single or multiple punch card sets are accurately positioned for positive registration. The new machine is a product of **The Hedman Company, 1158 W. Armitage Ave., Chicago, Ill.**

Write No. 59 on Inquiry Card—Page 32



A two-drum **rotary card file** was introduced recently by **Mosler Safe Company, 320 Fifth Avenue, New York 1, N. Y.** One person can handle all filing and posting of up to 15,000 active records. To find a card, the clerk touches the proper button. A control system instantly revolves the proper drum and automatically stops it when the desired section reaches position in front of the operator.

Write No. 60 on Inquiry Card—Page 32



Only Graphicopy® Papers feature the nail-saving E-Z Carry-Pak*

No bent fingernails—no chipped polish with Hammermill Graphicopy's exclusive E-Z Carry-Pak. Just unfold the two handles, and lift. Out come five packages of Hammermill Graphicopy papers slick as a whistle. You don't have to dig 'em out one at a time. Graphicopy papers run right on any kind of office printing and duplicating machine. And they give the kind of results any boss will appreciate—clean and crisp and colorful. Tip him off today—about new Hammermill Graphicopy papers.





HAMMERMILL GRAPHICOPY® PAPERS

*patent pending

For More Information Write No. 269 on Inquiry Card—Page 32

L. L. B. for alligator-size performance



If you're looking for paper that can stand constant hard wear, resist moisture, oil, fingerprints, high and low temperatures and will wash like glass — it's RESISTALL LINEN LEDGER and its companion INDEX BRISTOL.

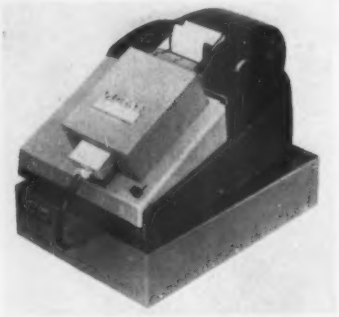
For complete information about L.L.B. papers ask your supplier, or write L. L. Brown direct.

"The quality which has earned its reputation"

L. L. BROWN PAPER COMPANY
ADAMS, MASSACHUSETTS

For More Information Write No. 270 on Inquiry Card—Page 32

Office Equipment



Development of a new solenoid-actuated, self-contained **scanning printer** designed to print data from high impedance decimal sources was announced by **Victor Adding Machine, Co., Chicago.** The normal operating speed is .250 seconds per column scanned. An additional .270 seconds is added with non-totalizing printers and .350 totalizing models. It may be modified to include special numerical, alphabetical and other symbols for identification purpurposes.

Write No. 61 on Inquiry Card—Page 32

Complete information about **dictating equipment** is offered free in a new 16 page illustrated book. "The Facts About Dictating Machines" lists important features buyers should look for when researching this product. It is published by **American Geloso Electronics, Inc., 251 Park Ave. South, New York 10, N. Y.**

Write No. 62 on Inquiry Card—Page 32



Portable office **dictating machines** are being marketed by **Comptometer Corporation, 1735 North Paulina Street, Chicago 22, Ill.** Weighing four and one-half pounds, the new unit is transistorized and has all of the controls on the hand microphone. It works on batteries which provide more than 24 hours of solid dictation, and it also works on AC current for office use.

Write No. 63 on Inquiry Card—Page 32



Changeable letter **bulletin boards** have been introduced by **Albert W. Pendergast Safety Equipment Company, Tulip and Longshore Streets, Phila. 35, Pa.** The new boards are constructed with a hardwood frame and a grooved black felt background. The letters are Roman style in white plastic.

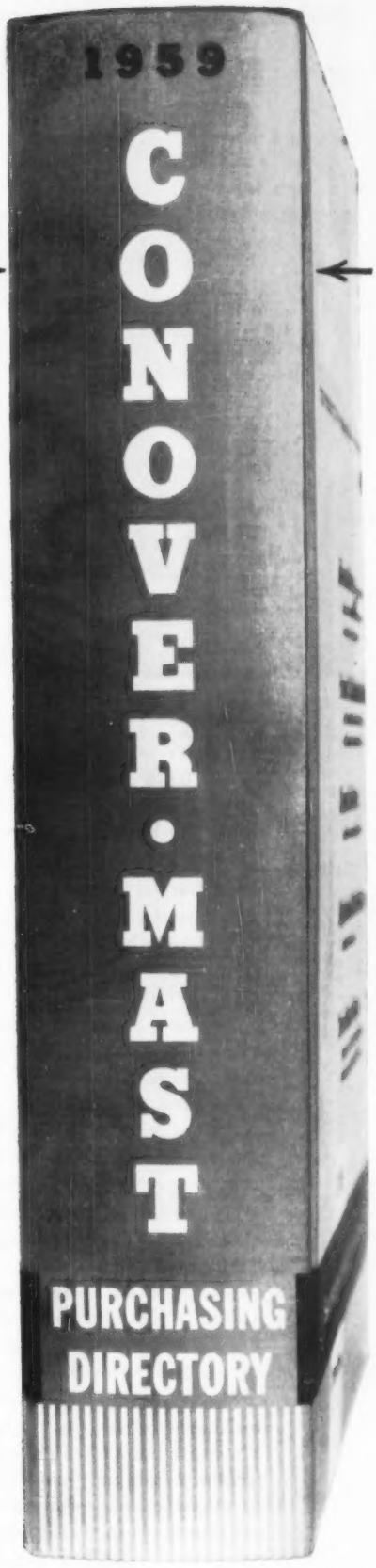
Write No. 64 on Inquiry Card—Page 32



New **photographic system** for use in reproducing documents in quantities of 10 to 1000 was recently introduced by **Eastman Kodak Company, Rochester, N. Y.** It can be used to make paper masters for offset reproduction, or it can make a limited number of direct copies without using the offset process. The new method can be used in conjunction with a conventional microfilm enlarger to produce masters from positve microfilm records of correspondence and engineering drawings.

Write No. 65 on Inquiry Card—Page 32

How can a directory this size (2½") be ***complete***?



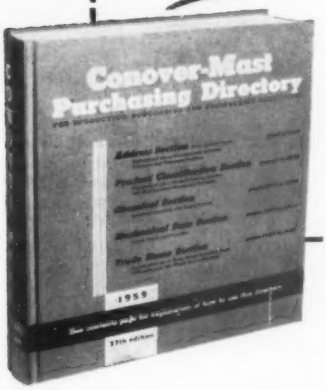
the reasons:

1 all consumer items are rigidly excluded

2 cross-indexing means no duplication of product headings

3 chemicals listed separately with space-saving "key" method

New



Conover-Mast Purchasing Directory now gives telephone numbers of companies selling to industry.

Next time you use a directory check C-MPD. You will find it complete, accurate, and easy to use. You will find the telephone numbers a real time-saver, too.

Conover-Mast Purchasing Directory

205 E. 42nd Street • MUrray Hill 9-3250 • New York 17, N. Y.

Where secure holding power is needed most...



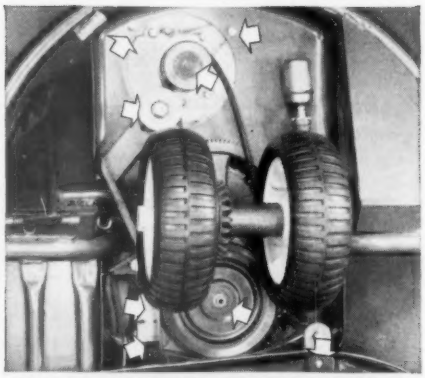
Users from coast to coast know about the quality construction of Roberton Twin Power Riding Mowers, made by Roberton Manufacturing Company, Chicago, Illinois.

Efficient riding mowers like these, constantly used to cut grasses of varying thickness and height, are subject to intense vibration. Yet their *two* power units are firmly held in place for long, dependable service by a total of 44 Republic Nylok Fasteners.

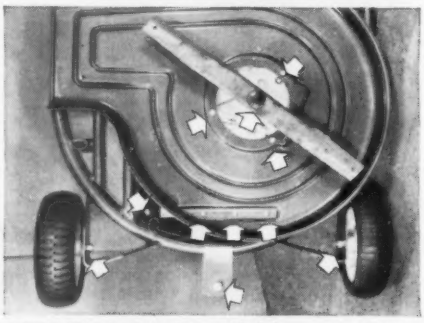
Republic Nylok Fasteners have a special nylon insert that assures positive locking at any position, even under severe shock, vibration, or tension. When the fastener is assembled, this nylon plug exerts pressure in a lateral direction, preventing all play, and utilizing the metal-to-metal contact of the opposing threads for locking.

Republic Nylok Fasteners provide maximum holding power under all conditions, whether seated or not; and they can be used repeatedly. One of their unique advantages is the "plastic memory" of the nylon plug—the tendency of the nylon to recover its original shape after assembly. This "growth" into the threads actually results in a tighter locking action, after a period of time, than when the fastener was first assembled.

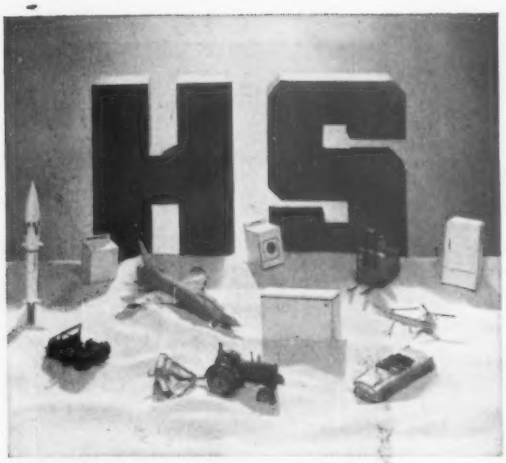
The nylon insert is unaffected by age or cold, has high resistance to heat, and very low moisture-absorption rate. These are but a few of the reasons why Roberton Manufacturing Company uses Republic Nylok Fasteners in its advanced line of power mowers. Advantages like these can pay dividends in *your* application, too. For full information, contact your Republic representative, or mail coupon.



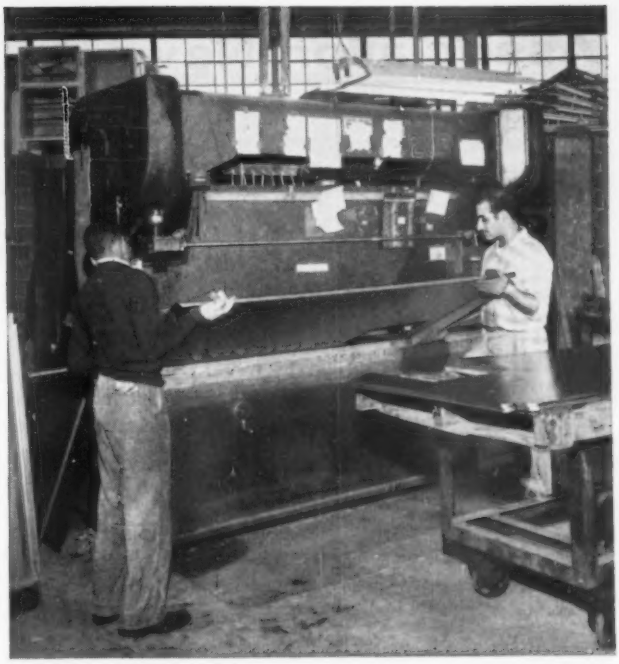
DRIVE UNIT, which furnishes motive power for Roberton Mower is securely held in place by Republic Nylok Fasteners as indicated by arrows. Engine remains tight against base even after years of hard service.

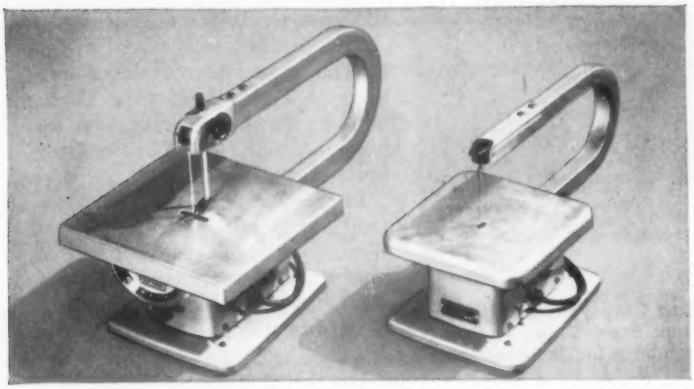


POWER FOR CUTTING is provided by a second, independent engine. Imagine the vibration set up by the swift-moving blade shown. Yet Republic Nylok Fasteners hold engine, wheels, and other parts, firmly in place.



REPUBLIC'S NEW HIGH STRENGTH POWDER, Type HS6460, opens the way to new markets for new applications using sinterings for highly stressed parts. Type HS6460 can be used with existing operating equipment. It provides a minimum tensile strength of 60,000 psi at 6.4 density as sintered, and 100,000 psi heat treated. Type HS6460 maintains its dimensional characteristics after sintering—less than .004 inches per inch shrinkage from die size at 6.4 density. Available in production quantities up to and including 12 tons, or in multiples thereof. Mail coupon for technical data sheet on Type HS6460 Powder.





EASY, EFFECTIVE FABRICATION is a characteristic of Republic Galvannealed Steel Sheets. Severe brake forming, shown above as done by Fogel Refrigerator Company, Philadelphia, does not affect their corrosion-resistant, paint-adhering qualities. Republic Galvannealed Sheets readily take shearing, punching, spot welding, and many other fabricating operations. Mail coupon for more facts.

SAVINGS IN A KEY PART are realized by Syncro Corporation, Oxford, Michigan, by using Republic ELECTRUNITE® Mechanical Tubing in the manufacture of jigsaws. Previously they used a casting for the blade-yoke, which requires a severe bend. ELECTRUNITE Square Tubing was recommended for one model, rectangular tubing for the other. Results: reduction in weight of the blade-yoke, and improvement in appearance of the product, with savings in time, materials, assembly, and shipping costs. For more information mail coupon below.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. PH-8003
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send additional information on the following:

☐ Nylok Fasteners ☐ Galvannealed Sheets
☐ Type HS6460 Powder
☐ ELECTRUNITE Mechanical Tubing

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

For More Information Write No. 271 on Inquiry Card—Page 32

Large Group Attends 6th District Conference

ALL WHO attended the recent Sixth District N.A.P.A. Purchasing Conference agreed that it was probably the best ever held. The host group was the Association of Purchasing Agents of Dayton. President C. L. Johnson and Conference Chairman Philip B. Hull deserve much of the credit for the success of the meeting.

N.A.P.A. president, T. O. English of Alcoa, gave a short talk and pointed some of his remarks at legislation detrimental to purchasing that was defeated in Congress this year but will be coming up again in the next session.



J. G. Smith, vice president-purchases, Pittsburgh Steel Corp., addressing workshop session on "Reports To Management."



Marcus Brooks, (far left) Westinghouse Electric Corp., Robert Benson, U. S. Steel, A. B. Wadsworth, Allegheny Ludlum Steel Corp., chairman and George Pratt of Alcoa, served as panel members for the session on "Analyzing Price Increases."



Session on Systems and Methods; W. D. Tittle of Yuba Power Product (speaking), and Lynn Percival, American Tool Works.

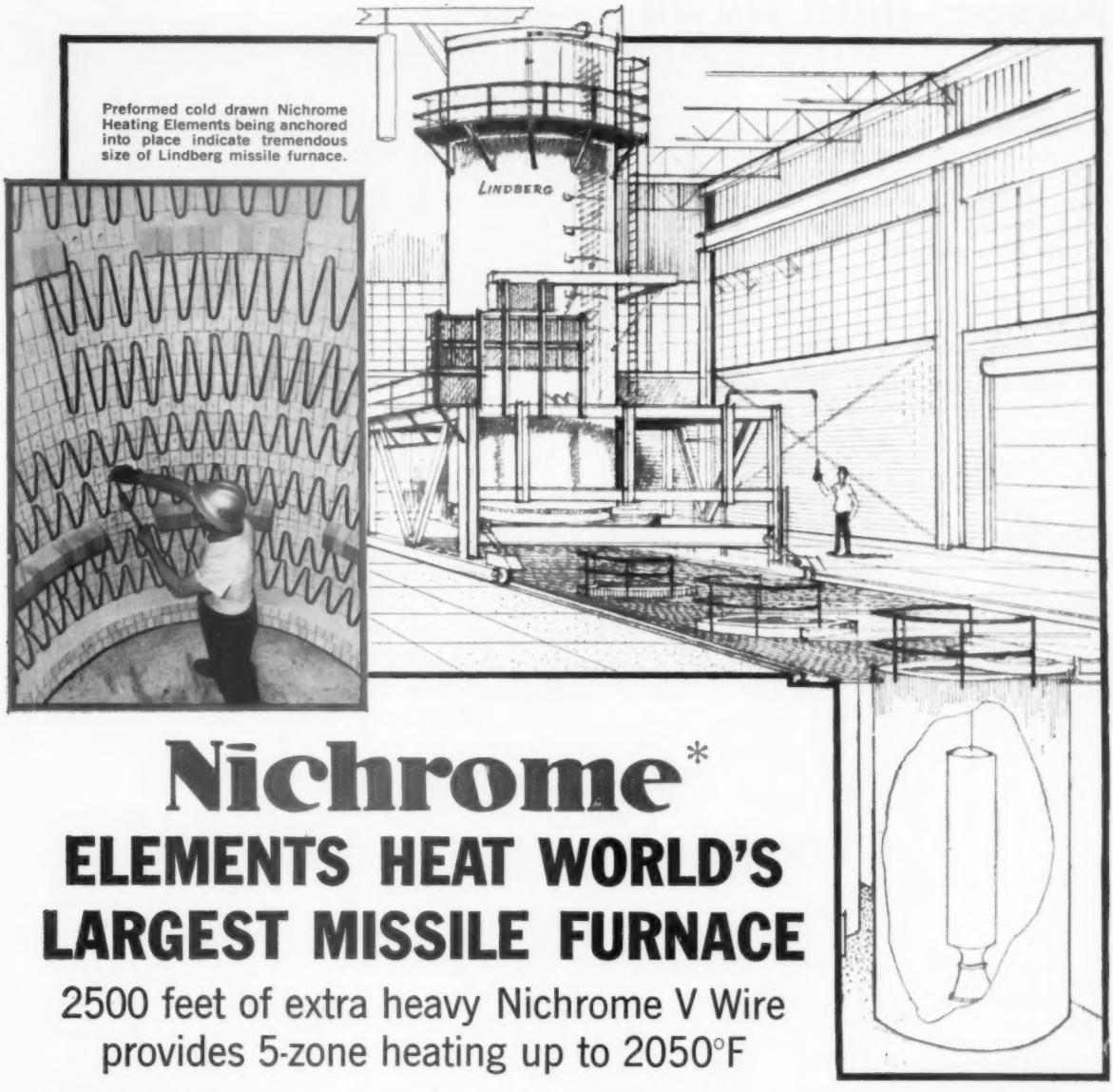
Mr. English also presented Ted R. Thompson, Aeroproducts division of General Motors Corp., with an award honoring him for his outstanding work in the Dayton Association.

In the first session, A M. Kennedy, vice president—purchases at Westinghouse, gave his views of the future of purchasing. He said that materials management will come into use much more in the future.

The balance of the conference was devoted to workshops which ran concurrently and provided members of the Sixth District with a diversified program.

Some of the outstanding session leaders and the topics they discussed were: Dr. A. V. Feigenbaum of General Electric on Quality Control; Lynn Percival—Systems and Methods in Purchasing; Joseph Grange Smith, vice president, Pittsburgh Steel Co., talked on Reports To Management; A. B. Wadsworth of Allegheny Ludlum Steel Corp.—Price Increases; and F. A. Onstine of the Central Metal Powders Co. on Purchasing For Small Companies. Small Volume Purchases was the topic led by H. C. Weber, Hammermill Paper Co.

(Please turn to page 174)



Preformed cold drawn Nichrome Heating Elements being anchored into place indicate tremendous size of Lindberg missile furnace.

Nichrome*

ELEMENTS HEAT WORLD'S LARGEST MISSILE FURNACE

2500 feet of extra heavy Nichrome V Wire provides 5-zone heating up to 2050°F

This giant 500 KW gantry type Lindberg† hardening furnace is the newest and largest ever built to meet the most exacting heat treating requirements of today's, and tomorrow's, missile metals. It accommodates an effective work load nearly 7 ft. in diameter and 24 ft. long.

Now in operation at Lindberg Steel Treating Company's Melrose Park Plant, the controlled atmosphere installation is both bottom loading and bottom quenching. The 19′ by 57′ pit—28′ deep, beneath the towering electrically heated furnace, houses the loading station, 2 quench tanks (atmosphere and salt) and water wash tank. Work loads pass from furnace to quench through an airtight seal, permitting complete control and precise duplication of atmospheres and treating cycles.

In the hardening furnace there are five control zones which operate between 250°F and 2050°F. Saturable core reactors automatically vary the voltage to the Nichrome*V heating elements between 2.2 and 220 volts, depending on temperature and load.

The selection of Nichrome V by Lindberg to supply reliable and closely controlled heat and temperature in this furnace is further evidence of the confidence that industrial leaders have in the quality and performance of Driver-Harris high-nickel alloys. Why not benefit from their experience. Tell us about your requirements. *T.M. Reg. U.S. Pat. Off. †Lindberg Engineering Company

DRIVER-HARRIS* COMPANY

HARRISON, NEW JERSEY • BRANCHES: Chicago, Detroit, Cleveland, Louisville

Distributor: ANGUS-CAMPBELL, INC., Los Angeles, San Francisco • In Canada: The B. GREENING WIRE COMPANY, Ltd., Hamilton, Ontario

MAKERS OF THE MOST COMPLETE LINE OF ALLOYS FOR THE ELECTRICAL, ELECTRONIC, AND HEAT-TREATING INDUSTRIES

For More Information Write No. 272 on Inquiry Card—Page 32

Association News

(Continued from page 172)

Many other fine sessions covered practically every phase of purchasing. The final session on Saturday morning was led by Dr. John H. Hoagland of Michigan State University, who gave the purchasing agents some tips on "Better Forecasting."



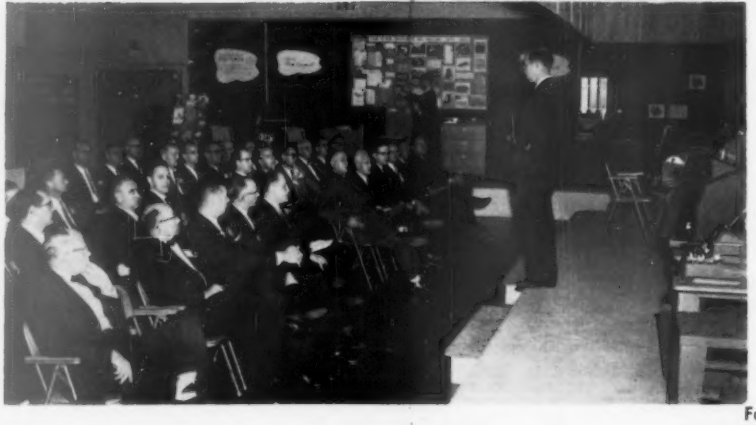
Among those at the head table: C. Warner McVicar, 6th District vice president, and C. L. Johnson, president of the Dayton Association.



Shown at the Sixth District banquet is Ted R. Thompson and his pretty wife. Mr. Thompson is the winner of the special award plaque given by the Dayton Association to its outstanding member.



Seated at one of the banquet tables are (left to right); Bob Owen of Monsanto Chemical; Bob Lantz, Jr. of Columbia Southern Chemical Co.; A. C. Allard and C. S. Poxon of Union Switch Co.; and Bill Doerman and Ben Rottert of Kroger Foods.

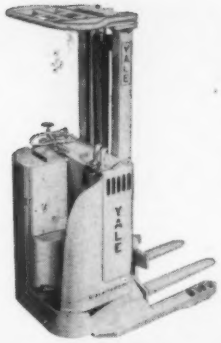


A workshop group heard a talk on integrated data processing at Standard Register Co., during the Sixth District Purchasing Conference.

For More Information about ad on facing page Write No. 273 on Inquiry Card—pg. 32→

NEW Yale Warehouser builds profits 3 ways

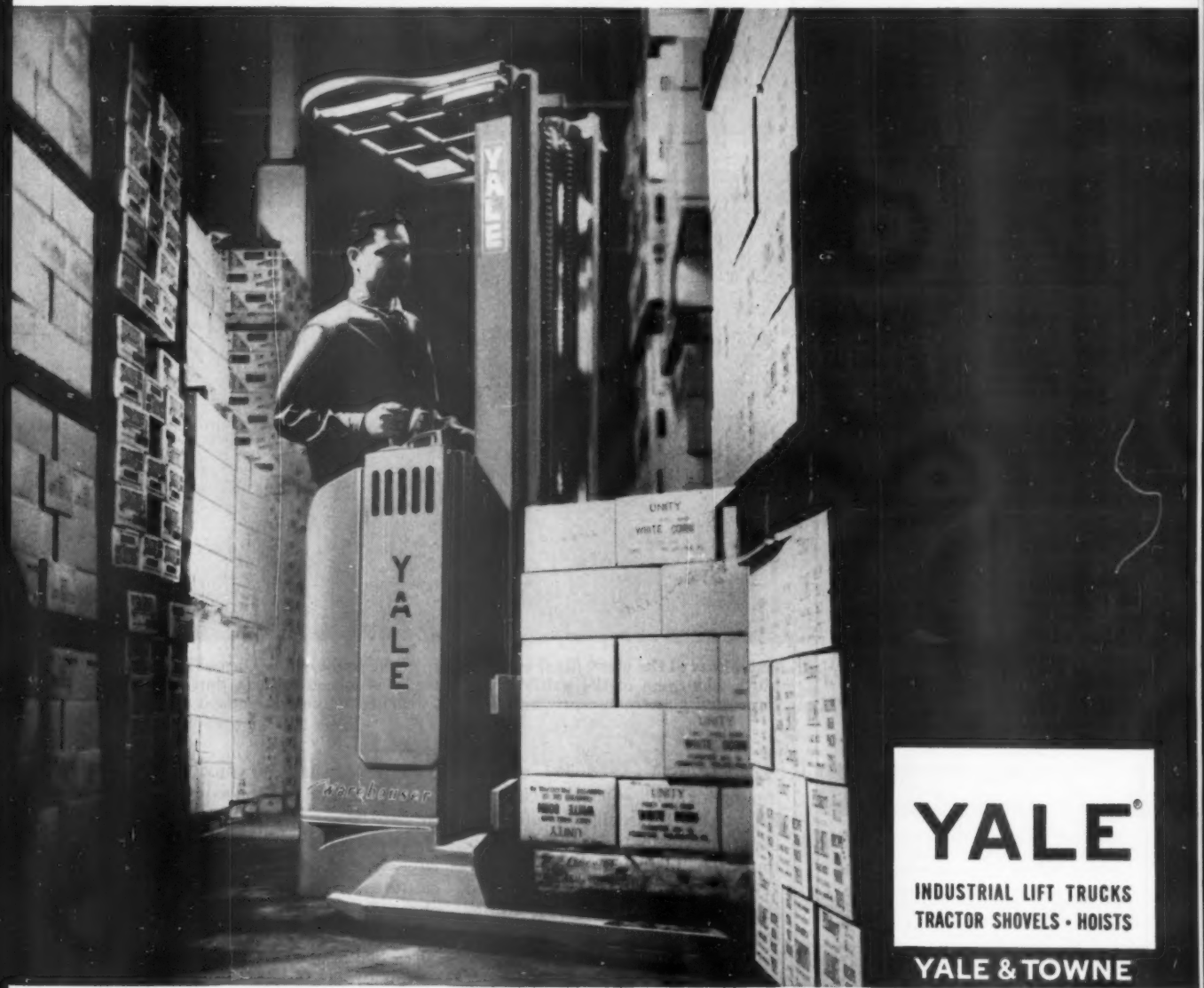
(1) 24-volt system speeds operation cycles (2) Advanced design increases operator efficiency (3) Rugged construction means more time on the job



There's more power in the new Yale Warehouser! 24-volt battery provides faster lift and travel! Faster operation cycles! And your operator will be less fatigued at the end of the day. He has comfortably positioned, easy-to-operate controls! This precision control plus increased visibility protects against product damage.

Your new Yale Warehouser will spend more time on the job! More days on the job! Operational maintenance is minimized because all components are in one fully-accessible compartment. More years on the job! Durable construction! Service access doors protected against bumps—no sprung doors. Frame, chassis, outriggers and channels are a single welded unit.

This new Yale narrow aisle truck is available in straddle and Extend-A-Fork models—in capacities of 2,000, 3,000 and 4,000 lbs. Standard 12-volt models also available. The new Warehouser takes its place as part of Yale's complete line of industrial lift trucks and hoists—gives equally efficient performance in the warehouse or as part of a fleet. Contact your Yale representative or write for brochure #1535H to The Yale & Towne Mfg. Co., Yale Materials Handling Division, Phila. 15, Pa., Dept. RT1-H.



Yale Materials Handling Division, a division of The Yale & Towne Manufacturing Company. **Manufacturing Plants:** Philadelphia, Pa., San Leandro, Calif., Forrest City, Ark.
Products: Gasoline, Electric, Diesel and LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Industrial Tractor Shovels • Hand, Air and Electric Hoists



FOR COMPLETE
SODIUM SILICATE SERVICE SEE **PQ**

Choose a sodium silicate for your needs from over forty PQ silicates. You'll get the right one for reliable performance.

PQ specializes in soluble silicates and can serve your specifications for either dry or liquid products.

Fast deliveries of bulk or carload and truckload of packages are available direct from our plants listed below. Less than truckload shipments from distributors' stocks in over 70 cities.

Whether you need information, test samples or prices, your requests are welcome.

PHILADELPHIA QUARTZ COMPANY
1033 Public Ledger Bldg., Philadelphia 6, Pa.

TRADEMARKS REG. U.S. PAT. OFF.

PQ SOLUBLE SILICATES

Associates: *Philadelphia Quartz Co. of Calif. Berkeley & Los Angeles, Calif.; Tacoma, Wash.; National Silicates Limited, Toronto, Canada*

PQ PLANTS: ANDERSON, IND.; BALTIMORE, MD.; BUFFALO, N.Y.; CHESTER, PA.; JEFFERSONVILLE, IND.; KANSAS CITY, KANSAS; RAHWAY, N.J.; ST. LOUIS, MO.; UTICA, ILL.

For More Information Write No. 274 on Inquiry Card—Page 32

Association News

Milwaukee Products Show Breaks All Records



Most heavily subscribed and attended product show in 25 years was held at the Milwaukee Auditorium by the Milwaukee Association of Purchasing Agents.



Exhibitors at the show filled every corner of the auditorium. Harold J. Jungbluth, chairman of the exhibit committee, was forced to turn down many interested manufacturers when the total reached maximum capacity of 195.

THE 25TH Products of Industry exhibit sponsored by the Milwaukee Association of Purchasing Agents was the best attended in history.

Over 190 exhibitors displayed their products. Harold J. Jungbluth, chairman of the exhibit committee, had to turn down others because the space was filled to capacity.

A large number of purchasing agents, along with industrial executives in other fields toured the show. President of the association is Fred J. MacDougall.

For More Information about ad on facing page Write No. 275 on Inquiry Card—pg. 32→



Your order can be this small. One self-lubricating bearing, custom made. You'll get the same prompt, interested service as you would if you ordered Bound Brook bearings by the ton.

BOUND BROOK

Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Pioneer in Powder Metallurgy Bearings and Parts.
Plants at Bound Brook, N.J. and Sturgis, Mich.



Fast Shipment FROM WORLD'S LARGEST

STOCK of STAINLESS STEEL

AN—MS COMMERCIAL BOLTS

SCREWS—Complete range of machine and self tapping with slotted or Phillips recessed heads, both magnetic and non-magnetic.

NUTS—Cap, Hex, Castle, Slotted, Square, Wing, etc.

PINS—dowel, taper, etc. Plus washers, rivets, threaded rod, studs, nails, many more.

"SPECIALS"—fabricated to your specs on extremely short notice.

WRITE • WIRE • PHONE

FOR QUOTATION OR SHIPMENT ASK FOR CATALOG

ALLMETAL®

Screw Products Company, Inc.

Manufacturers of Stainless Fasteners Since 1929

821 Stewart Avenue, Garden City, L.I., N.Y.
Phone: Pioneer 1-1200 TWX GCY 603

Midwest Division
6424 W. Belmont Avenue, Chicago 34, Illinois
Phone: AVenue 2-3232 TWX CG 3185

West Coast Division—Office and Warehouse
5822 West Washington Blvd., Culver City, Calif.
Phone: WEbster 3-9595 TWX LA 1472

For More Information Write No. 276 on Inquiry Card—Page 32

Association News

Planning Cleveland Programs



Officers of the Cleveland Association check over the program for the rest of the year. They are (left to right): S. P. Brownell, The Illuminating Co., second vice president; R. Bosch, Thompson-Ramo Woolridge Inc., president; P. P. Averill, The Warner & Swasey Co., secretary-treasurer; and W. H. Conant, Weldon Tool Co., first vice president.

Speaks to Louisville P.A.'s



Harry Stuhldreher (left) of the U. S. Steel Corp. was principal speaker at a meeting of the Louisville Purchasing Agents Association. Shown with him are (left to right): R. B. Sweeney, U. S. Steel; John Tierney, W. M. Cissell Mfg. Co.; R. F. Schneider, U. S. Steel; and Dan Marks, Sutherland Paper Co.

Headquarters for SPECIFICATION ADHESIVES

ARABOL



For each end use—a specification adhesive

The rapid advances in packaging and converting have called for equally startling advances in adhesives. Today, it is almost as common to stick "like to un-alike" as like-to-like. Foil, paper, film, metal, glass, fabrics—for almost any combination, a dependable ARABOL Specification Adhesive can be formulated.

Beyond the question of sticking "what to what," are all the matters of how your adhesives will be applied and all the conditions your product, package, label or shipping case will meet in use, transportation, storage, display or re-use.

Adhesives made to meet each of your particular requirements cost little more (and sometimes less) than run-of-mill adhesives. The advantages and savings are appreciable.

We invite the opportunity to submit formulated samples—for tests to be made in your own plant—under your particular working conditions. That is the one kind of testing that assures you of satisfactory results.

Our fourteen plants and warehouses—plus four laboratories—are your assurance of service and delivery. It is our privilege to serve both large and small users. May we send you a booklet suggesting 23 basic specifications you should consider before you next buy adhesives?

THE **ARABOL** MFG. CO.
a nationwide organization serving major users of industrial adhesives
EXECUTIVE OFFICES: 110 East 42nd Street, New York 17, N.Y.
CHICAGO • SAN FRANCISCO • LOS ANGELES • ST. LOUIS • ATLANTA
PHILADELPHIA • BOSTON • PORTLAND, Ore. • ITASCA and
McALLEN, Tex. • CINCINNATI • DENVER • TAMPA • LONDON, Eng.

74 YEARS OF PIONEERING IN THE MAKING OF ADHESIVES

For More Information Write No. 277 on Inquiry Card—Page 23

ALLEN



ALLEN is the dowel pin that gives you PLUSES!

Your ALLEN Industrial Distributor can show you a good many ways to use ALLEN Dowel Pins, in addition to conventional uses in tool and die work. You can use them as economical roller bearings, axles, precision plugs, hinge and wrist pins—and in many other ways.

You can cut the cost of your product substantially, too—because your ALLEN Distributor can supply these strong, accurate, mirror-finished Dowel Pins in standard sizes right from stock.

Made of special Allenoy steel; surface hardened to 62-64 Rockwell C; precision ground to .0001" with micro-inch finish of 6 RMS max. Check your Allen Handbook or Catalog for detailed specs and standard sizes, or write direct for samples and technical information.



Genuine ALLEN products are available only through your ALLEN Distributor—he's always ready, willing and able to give you prompt, practical service.

ALLEN MANUFACTURING COMPANY Hartford 1, Connecticut

ALLEN HEX-SOCKET SCREWS HEAD

For More Information Write No. 278 on Inquiry Card—Page 32

Association News

"Meet Foreign Competition" P.A.'s In Buffalo Told

E. F. Andrews, director of purchases for Allegheny Ludlum Corporation, spoke to the Buffalo Purchasing Agents Association recently.

In his talk, "Purchasing In The Society of Abundance," Mr. Andrews said that industry in the United States must strive to cut production costs in order to meet foreign competition. This reduction would have to be in material, inasmuch as cost-cutting labor is almost an impossibility; and featherbedding offsets machine cost cutting.

The director of purchases also said that purchasing agents and other executives should take stock of our present educational system. He urged the group to take an active part in education and also politics to bring an end to "profitless prosperity."

About the clamor of the purchasing profession for more recognition, he remarked that management has already recognized the purchasing agent, and it is about time that some of the P.A.'s began to deliver.

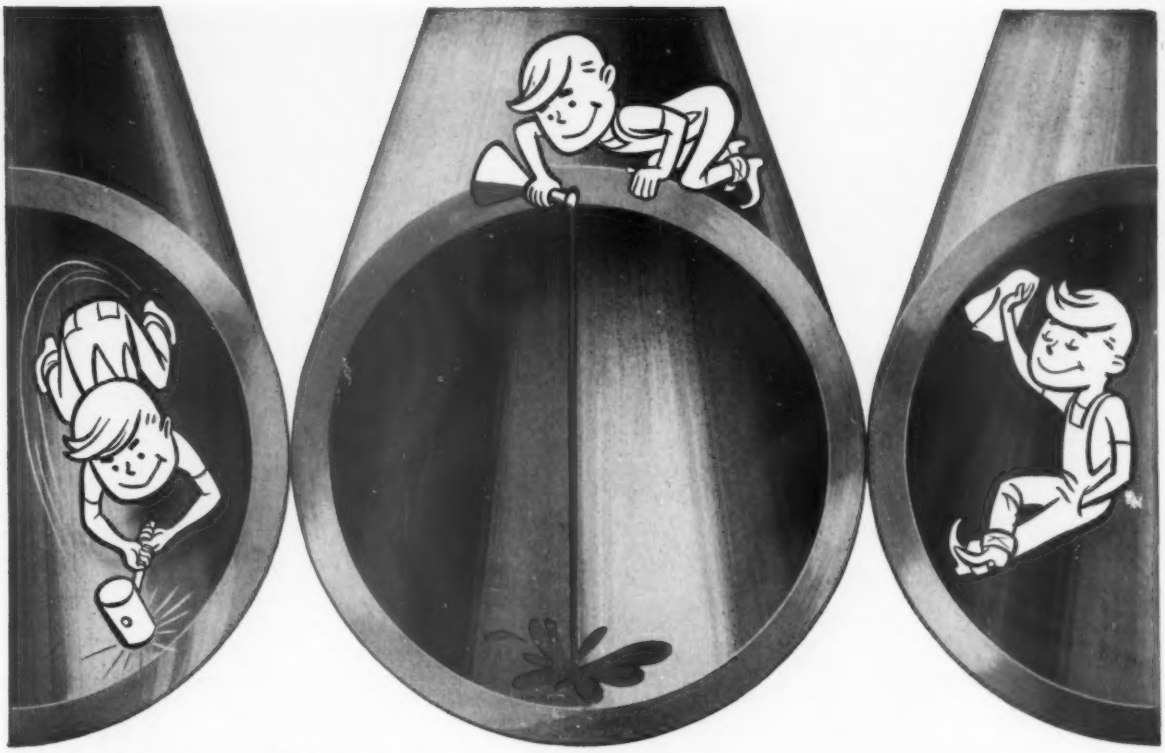
Robert E. Mills, the program chairman, also introduced Frank Best of Linde Company, VASCO chairman, who spoke on "Cutting Costs by Applying Value Analysis."

Mr. Best and his VASCO committee also conducted the premeeting forum on standardization which included the showing of the N.A.P.A. filmstrip, "Value Analysis-Standardization."

Metropolitan Purchasers Discuss Role of P.A.

Donald T. Keliher, director of purchases of the United States Metals Refining Co. was the principal speaker at a recent meeting of the Metropolitan Purchasers Club in New York City.

"Administration of the Purchasing Function" was the topic of Mr. Keliher's talk.



The smoother surface of CONTOUR-WELDED* STAINLESS TUBING *gives it greater resistance to corrosion*

Recent tests prove: (1) *Contour-welded* tubing is smoother than any other tubing, and (2) this extra smoothness provides greater resistance to corrosion.

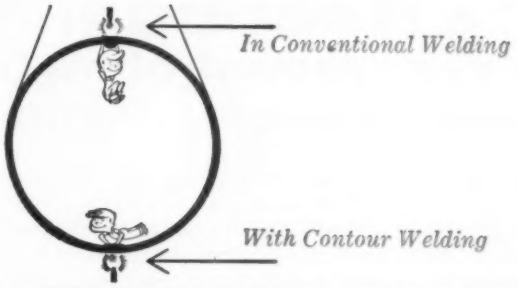
Here's how TRENTWELD® tubing, made by the exclusive *Contour-Weld* process, compares with other full-finished tubing:

- It's smoother than seamless because it's formed from uniformly rolled strip steel, whereas seamless is extruded or pierced.
- It's smoother than other welded tubing because the *Contour-Weld* process, patented by Trent, virtually eliminates the weld bead.

Other tests prove this smoother surface provides *increased resistance to corrosion* — because there are fewer focal points for corrosive attack. Not only that, the smoother surface ensures *longer fatigue life* and *less product incrustation.*

But get full details. Our free 48-page *"Trentweld* Manual" gives complete data on *Contour-Welded* tubing in sizes from ⅛" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy and Hastelloy.† Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.

†Trademark Haynes Stellite Co.



In CONVENTIONAL WELDING of tubes, gravity pulls the molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

***With CONTOUR-WELDING** the tube is welded at the bottom. Gravity still pulls the molten metal down inside the tube, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.

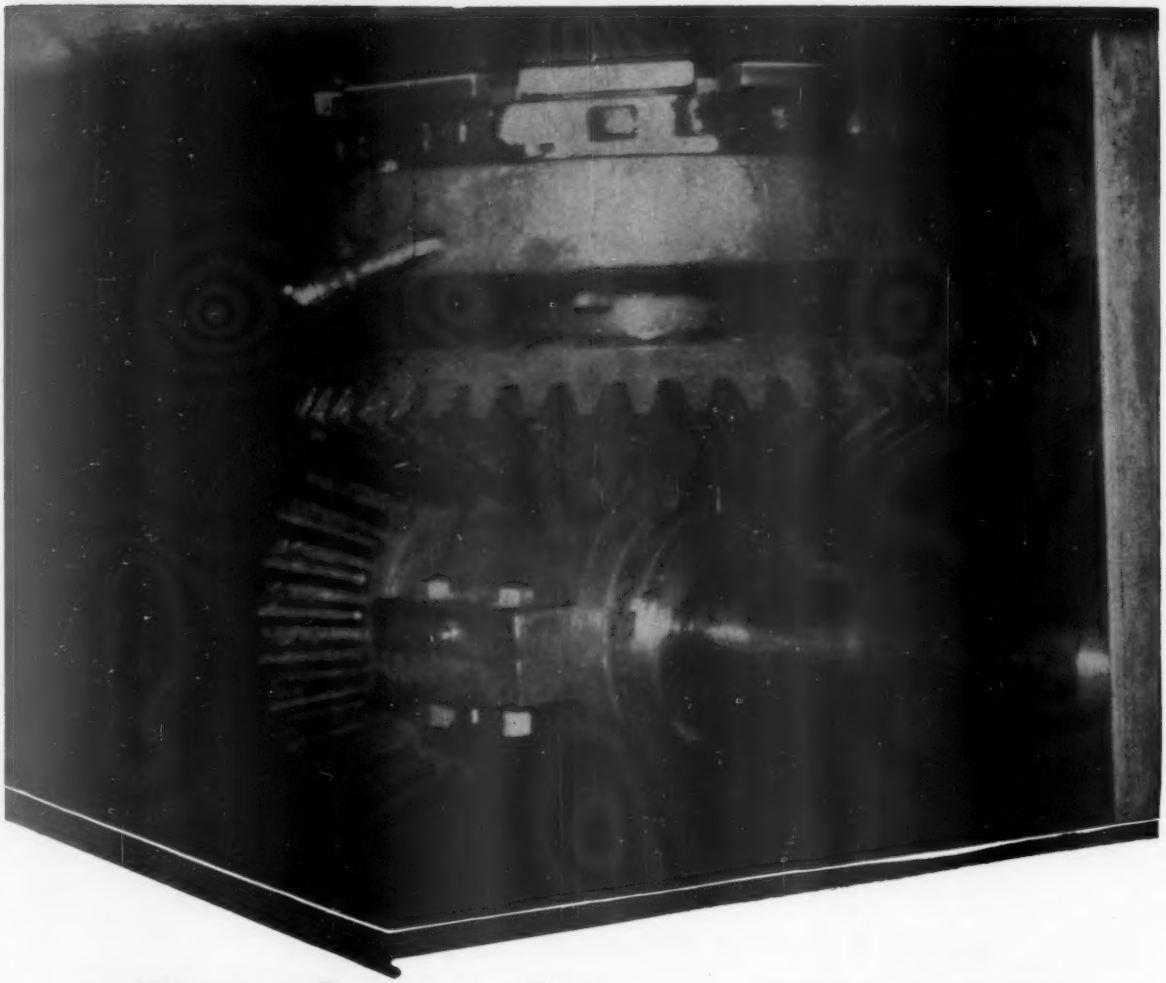
CONTOUR TRENTWELD

stainless and high alloy pipe and tubing

TRENT TUBE COMPANY

Subsidiary of Crucible Steel Company of America • GENERAL OFFICES: East Troy, Wisc. • MILLS: East Troy, Wisc.; Fullerton, Calif.

For More Information Write No. 279 on Inquiry Card—Page 32



a Bearings, Inc. conversion with a 2 year record of no lost production, reduced maintenance . . . and a 30% Power Savings!

Over two years ago our engineers converted this main drive gear from a babbitt bearing to a ball bearing unit on a machine at Highland Park Manufacturing Company, Charlotte, North Carolina. Performance of this conversion, according to company engineers, has been outstanding! The housing for the bearings as well as the gear hub was produced by the customer in their own machine shop.

Prior to conversion, machine downtime was excessive because the babbitt had to be repoured every three or four months. A plus saving was in the reduction of power required to operate the machine. Highland Park Manufacturing Company officials now find power consumption is 30% less!

If your older equipment can be modernized with anti-friction bearings — our engineers can show you how. If you need bearings for any purpose, our stock carrying branches can supply you. We are *authorized* distributors of most nationally known makes of bearings. We and the makers guarantee every bearing we supply — Call the branch nearest you now!

Providing bearing service in the North →

BEARINGS, INC.

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Painesville • Toledo • Youngstown Zanesville • **INDIANA:** Ft. Wayne • Indianapolis • Muncie • Terre Haute • **PENNSYLVANIA:** Erie • Johnstown • Philadelphia • Pittsburgh • York **WEST VIRGINIA:** Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden **NEW YORK:** Bolanrol Corp., Buffalo • Niagara Falls • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington

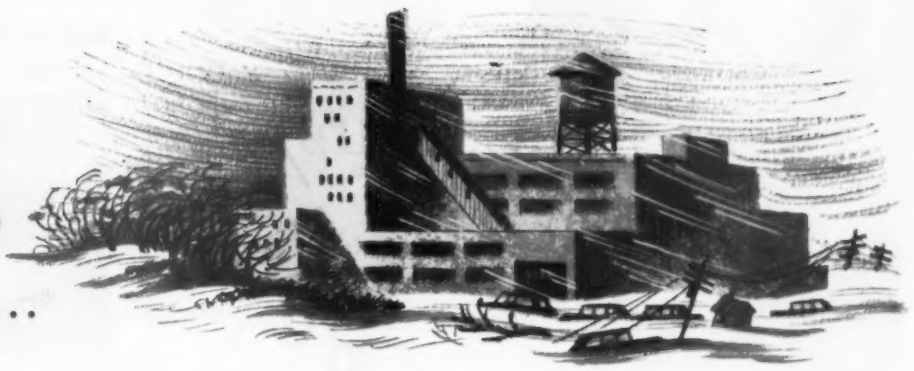
and in the South →

DIXIE BEARINGS, INC.

FLORIDA: Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge • New Orleans **N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville **VIRGINIA:** Norfolk • Richmond

For More Information Write No. 280 on Inquiry Card—Page 32

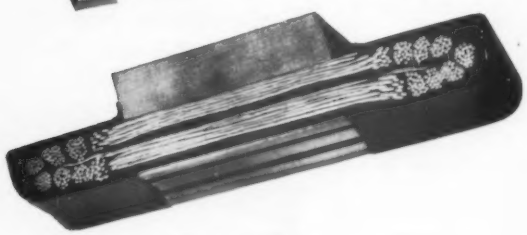
WHEN THE FLOOD IS OVER . . .



the motors in this plant will run . . . if they're LINCOLN MOTORS!



Multiguard-protected stator has no exposed wires. Cutaway, below, shows how wires are imbedded in the Multiguard polyester compound for complete protection.





Bearings permit mounting of Lincoln motor in any position.

LINCOLN MOTORS HAVE PROTECTION WHERE IT'S NEEDED —ON THE WINDINGS! Multiguard, a polyester resin, is extruded through and around the windings of the stator to form a rock-like, impenetrable mass. The stator of a Lincoln motor looks like a stone doughnut (see photo at left) and is just as tough. Water, oil, dust, acid, alkalies and just plain dirt can't get near the windings. The wires, themselves, are held rigid. They can't vibrate and wear off insulation.

BEARINGS ARE SUPER-PROTECTED, TOO. Double shields keep out contaminates. Grease reservoirs contain enough lubrication to last for years, yet the bearings are designed to resist over-lubrication. The bearings on this motor are designed to contribute to the long, trouble-free life that has been built into the motor with Multiguard protection.

HOW GOOD? For six years, Lincoln motors with Multiguard have been outperforming totally enclosed motors on torturous jobs.

HOW MUCH? Lincoln motors cost no more than ordinary drip-proof motors—20% less than totally enclosed motors.

SIZES AND TYPES! One to 100 horsepower, AC, squirrel cage, polyphase motors.

WHERE? Call your local Lincoln office. It's listed under Lincoln Electric in the "A to Z" list of manufacturers in Thomas Register, or in the Yellow Pages of your telephone directory.

LINCOLN ...USA

THE LINCOLN ELECTRIC COMPANY

Department 1409 • Cleveland 17, Ohio

The world's leading manufacturer of arc welders and electrodes, AC motors and battery chargers.

For More Information Write No. 281 on Inquiry Card—Page 32



SURVEY DISCLOSES INDUSTRY'S NO. 3 SKIN HYGIENE PROBLEM: WASTE SOAP

Here's The Answer To It From SBS

The most difficult three industrial skin hygiene problems, as rated by 2,177 major plants recently surveyed, are:

1. *SKIN DISEASE*
2. *REMOVAL OF TOUGH SOILS*
3. *WASTE OF SOAPS*

Closely associated with the actual problem of skin disease is the costly waste of soaps in *all* plant areas. Liquid soaps run off hands too easily, other types melt or spill. Where wasted soap accumulates, extra housekeeping expenses are involved, sub-sanitary conditions exist and worker dissatisfaction mounts. Often the combined cost of soap waste and resulting maintenance can add up to more than the original cost of the soap supply. Small wonder industry rates it as such a problem!

What's the answer to it? Ask an SBS representative to show you "Operation Pinpoint", 10 minute sound slide digest of the national survey, and you'll see how a *planned corrective program* can solve all these skin hygiene problems. Since SBS produces a *complete range of cleansers*, he can suggest the right cleanser for each job. For the safest, savingest answer to skin disease, tough soils, and soap waste, write today . . . Dept. 5-L.

the washword of industry

SBS sugar beet products co.

SAGINAW, MICH. • Los Angeles, Calif. • Newark, N.J

CANADA: Chemical By-Products, Ltd., Toronto, Ontario

For More Information Write No. 282 on Inquiry Card—Page 32

Industry

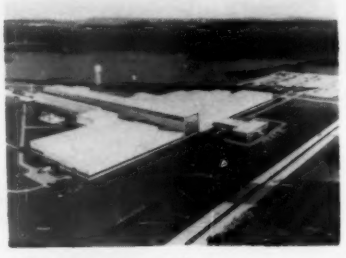
Melnor Opens Sprinkler Plant in New Jersey



A new 75,000 square foot building has been opened by Melnor Industries, Inc. in Moonachie, N.J. The one-level plant—located on a six acre plot—includes executive offices and manufacturing facilities for lawn sprinklers and garden accessories. An additional eight acres have been left free for future expansion.

White glazed brick, window wall, aluminum mullions, and blue porcelain panels have been used for the exterior. An overhead permanent concrete canopy was constructed on the walk from the parking field to the main entrance for protection against inclement weather. The factory will employ a maximum of 750 people.

Westinghouse Starts Giant Transformer Plant



Construction of a new power transformer plant has begun in **Muncie, Ind.** for the **Westinghouse Electric Corp.** The new plant, which represents Westinghouse's largest single capital expenditure to date, is being built to meet the expected increase in demand for high-kva, high-voltage transformers.

The T-shaped structure will contain over 600,000 square feet of floor space. The main assembly

(*Please turn to page* 188)

For More Information about ad on facing page Write No. 283 on Inquiry Card—Page 32→

beauty is stainless steel

Look for the beauty of Stainless Steel on your new automobile. Its bright finish will make your car look better, stay in style longer and have a higher trade-in value.

No other metal offers the freedom of design and fabrication, economy of care and the durable beauty that serves and sells like Stainless Steel.

McLOUTH STEEL CORPORATION, Detroit 17, Michigan

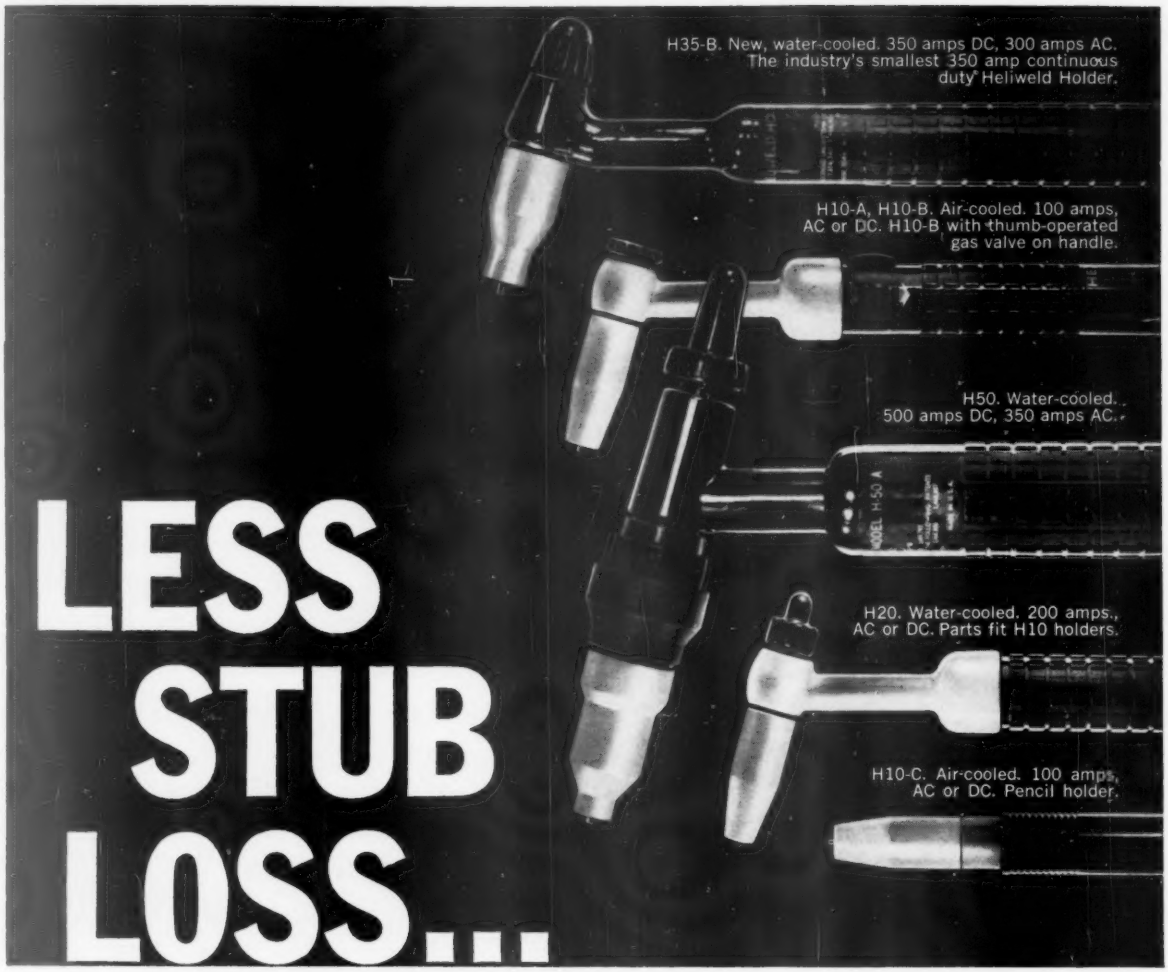


specify

McLOUTH STAINLESS STEEL

HIGH QUALITY SHEET AND STRIP

for automobiles



one of 4 big reasons why you'll go for these AIRCO Heliweld Holders

1. **LESS ELECTRODE LOSS**—You can reduce stub losses as much as 50% when Heliwelding thin gauge aluminum, stainless, copper base alloys, zirconium, magnesium or killed steel . . . if you use an Airco manual Heliweld Holder. You throw away less than one inch of stub (not 3 inches).

You make other savings too. You use alumina nozzles, for example, which have high resistance to heat and impact shock. You save on the gas, because you need less for adequate coverage.

2. **A HOLDER FOR EVERY JOB**—The complete range of Airco Heliweld Holders, rated from 100 to 500 amps, assures proper holder selection for your job.

3. **FULL CAPACITY RATINGS**—The five Airco Heliweld Holders provide for the industry's widest range of current selection in a single integrated line. Holders are rated at full capacity for continuous duty cycle for argon or helium, AC or DC. Non-turbulent gas flow and high current density combine to give you welds of X-ray quality.

4. **EASIER HANDLING**—For easier handling try the new H35-B. You'll find it the standout holder for work in tight corners. All of the holders feature Airco's non-slip corncob handle. Weights are a mere 4 ozs. to 11 ozs.

Heliweld Economy Packs are available from your Authorized Airco Dealer. He's listed in the Yellow Pages under "Welding Equipment and Supplies".

AIRCO®

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated

150 East 42nd Street, New York 17, N.Y.

Offices and authorized dealers in most principal cities

On the west coast—
Air Reduction Pacific Company

Internationally—
Airco Company International

In Cuba—
Cuban Air Products Corporation

In Canada—
Air Reduction Canada Limited

All divisions or subsidiaries of Air Reduction Company, Inc.

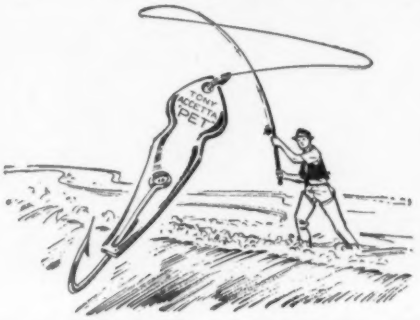
For More Information Write No. 284 on Inquiry Card—Page 32

BUSINESS IN MOTION

To our Colleagues in American Business . . .

Wham! And the fisherman hooks another record-breaker on the lure you see below. Just as that smart angler knew how to successfully fish that "Pet" Spoon bait so did the maker who designed and perfected it know exactly where to go in search of the brass from which to make that lure.

In order to produce the finest quality bait at a competitive price, he knew that he required a metal that could be easily stamped and formed, and of such quality and uniformity of grain structure that only the minimum of finishing would be required prior to the chromium plating of the lure.



Past experience had proved to this artificial bait manufacturer that, of the various commercial metals available, brass was the metal to use for this lure. For brass is easily stamped and formed . . . has just the right "heft" for casting, does not rust and it takes chromium plating as a fish takes to water. But when it came to selecting the exact type of brass that would best fit his exacting requirements, he called on Revere.

The result was a Revere Brass with special grain size and finish, and just the right ductility so that even after stamping and forming only a minimum of work is required prior to chromium plating.

Said the manufacturer, "Without a doubt, the fine quality of Revere Brass has contributed immeasurably to the quality of our baits, at the same time saving us money on forming and finishing cost. In fact, it is the quality of the material, plus design and workmanship that has made it possible for us to be awarded the Medal of Honor by the Sportsman's Club of America for the superiority of design and fish-getting ability of our baits, as well as the National Sportsman's Research Award, which is a real tribute to the design, workmanship and effectiveness of our lures."

The experience of this manufacturer, once more illustrates how, only by working closely with your supplier are you able to realize the highest return per dollar spent. That, too, is why it may very well pay you to let Revere help you "fit the metal to the job." Others have profited by this service, why don't you take advantage of it?

COPPER • BRASS • 18 01 • REVERE • ALUMINUM

REVERE COPPER AND BRASS INCORPORATED

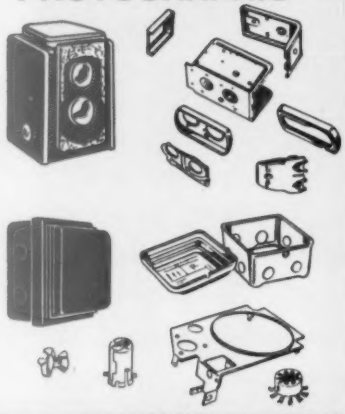
Founded by Paul Revere in 1801

Executive Offices: **230 Park Avenue, New York 17, N. Y.**

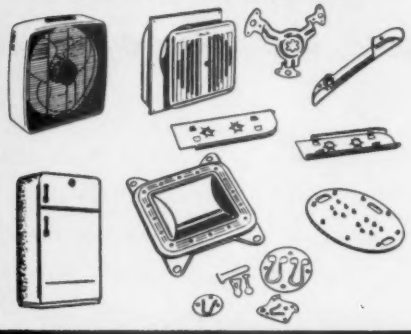
For More Information Write No. 285 on Inquiry Card—Page 32

Whatever Your Field Check DE-STA-CO for Stampings with the Plus

ELECTRICAL
ELECTRONIC
PHOTOGRAPHIC



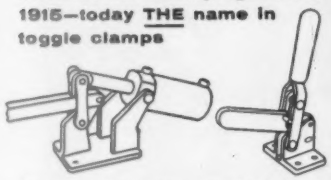
HEATING—COOLING



HARDWARE
AUTOMOTIVE
AIRCRAFT



DE-STA-CO—stampings since 1915—today THE name in toggle clamps



De-Sta-Co has been recognized for over 25 years for its leadership in the field of production clamping devices. Today, our engineers are creating improved and special toggle clamps to meet your specialized production problems in every field. Over 130 models, types and sizes, stocking distributors everywhere. Send for catalog.

Our range of stamping production has made De-Sta-Co known as an important source from coast to coast. We're regular suppliers to the most widely diverse industries—electrical, electronic, photographic—refrigeration, heating and ventilating—hardware, automotive, aircraft. All of these require top quality—and we take off our hats to none—but in addition to quality they want De-Sta-Co's *other* pluses: service, integrity, modern equipment, second operation facilities, ample inventories of all common and many unusual materials. Our know-how is as extensive as you'll find in the business and the big *pluses* we give you *gratis*!

Next time, check with De-Sta-Co for stampings, prices and *PLUSES*! Prints, samples or detailed letter will get you fast results. Qualified representatives from coast to coast. Write for the name of the De-Sta-Co man in your area.

De-Sta-Co is widely known for toggle clamps, stampings, precision washers, spacers, shims, shim and feeler stock, blower housings and marine specialties.

DE-STA-CO
ORIGINATORS OF PRODUCTION CLAMPING

DETROIT STAMPING COMPANY
408 MIDLAND AVENUE • DETROIT 3, MICHIGAN

Industry

(*Continued from page* 184)

aisle will be almost 900 feet long and ten stories high. Automated production and precise process control will be achieved with a wide variety of automatic machine tools and test equipment.

Opens New Office and Research Buildings



The Keasbey & Mattison Co., manufacturers of asbestos and heat insulation products, has opened new headquarters offices and a research and development center at **Ambler, Pa.** The new office building, which contains 20,000 square feet of floor space on two floors, houses the company's executive, financial, purchasing, and statistical departments. Besides laboratories for product study the research center has special facilities for simulating climatic conditions for environmental testing.

Taylor Fibre Opens Chicago Warehouse

To make laminated plastics rapidly available in the Chicago area the **Taylor Fibre Co., Norristown, Pa.**, has opened a warehouse at **4652 West Lawrence Avenue, Chicago, Ill.** The warehouse will stock glass-base plastics in sheet form in four grades: glass melamine, glass silicone, and two types of glass epoxy.

APECO Expands Main Plant

By adding a 30,000 square feet paper coating alley the **American Photocopy Equipment Co.** will double its production capacity at its **Evanston, Ill.** plant. Produc-

(*Please turn to page* 190)

For More Information Write No. 286 ←on Inquiry Card—Page 32

When Abrasion Protection is Vital, Specify PIONEER



These flexible coated gloves provide long-wearing liquidtight protection for materials handling:

Style No.	Glove Material	Type
Hand and Wrist Protection		
Light Weight		
80	Neoprene	C
Industrial Weight		
5062-J	Pylox	C
5232-J	Pylox	C
5052-W	Pylox	C
5062-AV	Pylox	C
5232-AV	Pylox	C
90	Neoprene	C
100	Neoprene	10"
50	Pylox	C
60	Pylox	C
50-AV	Pylox	C
60-AV	Pylox	C
Heavy Duty Weight (Non-Slip)		
95	Neoprene	C
105	Neoprene	10"

AV — "Aero-Vent Back" for greater ventilation.
J — Jumbo Size W — Women's Size



Style No.	Glove Material	Type
Hand, Wrist and Forearm Protection		
Industrial Weight		
5132-J	Pylox	B
5252-J	Pylox	D
120	Neoprene	B
513	Pylox	B
515	Pylox	D
140	Neoprene	D
Heavy Duty Weight (Non-Slip)		
125	Neoprene	B
145	Neoprene	D
Hand, Wrist, Forearm to Elbow Protection		
Industrial Weight		
180	Neoprene	18"

Send For PIONEER's Revolutionary "Foolproof Glove Selector"

Helps you solve many hand protection problems — whether they involve chemicals, abrasion resistance, worker fatigue, extreme hot and cold temperature, or products that must be protected from hands! Eliminates costly errors in glove selection.



the PIONEER Rubber Company Willard, Ohio, U.S.A.

The PIONEER Rubber Company (A)
233 Tiffin Road, Willard, Ohio

Please send me:

- ☐ New "Foolproof Glove Selector" by PIONEER.
- ☐ New Pioneer Industrial Glove Catalog
- ☐ 17" x 22" Full Line Glove Wall Chart

Firm _____

Address _____

City _____ Zone ___ State _____

Requested by _____

For More Information Write No. 287 on Inquiry Card—Page 32

Manufacturers of Cold Headed Fasteners Since 1888

Hubbell has the capacity to produce and deliver on time the finest quality standard or special fasteners in the quantity required up to a maximum diameter of ⅜". This statement is backed by the facilities listed here and supported by over 70 years' experience in cold heading.

COLD HEADING

Each operation is quality controlled to insure high quality and precision.

SLOTTING

Mass production is maintained without sacrificing accuracy or quality.

THREAD ROLLING

TURNING POINTING

The use of our engineering service offers the ultimate in engineering know-how.

DRILLING TAPPING

Prices and delivery on request. Simply send blueprint and/or sample of the item.

PLATING HEAT-TREATING

QUALITY CONTROL

HARVEY HUBBELL,
INCORPORATED
Machine Screw Dept. Bridgeport 2, Conn.

For More Information Write No. 288 on Inquiry Card—Page 32

Industry

(*Continued from page* 188)

tion of specially coated paper for photocopy equipment will supplement existing facilities at **St. Louis and Cedar Rapids,** An additional 10,000 square feet will be added for research, engineering and development operations.

SPS to Produce Beryllium Fasteners

The Standard Pressed Steel Co., Jenkintown, Pa. has opened a new exotic metals laboratory to fabricate beryllium into threaded parts. The unit will also undertake research in the fabrication and handling of the lightweight metal which has one-fourth the weight of steel.

R&D—Purchasing

(*Continued from page* 81)

ating costs, and sales volume for several years in the future.

This request should also include a contribution from purchasing—a prediction of raw material prices for several years into the future. Careful reasoning, based on information available from many sources, can provide a sound basis for estimating future raw material costs. A product which is profitable today may be a losing or marginal proposition in the future if raw material costs increase appreciably. Since more than one product group may be requesting capital funds— and such funds are normally limited, a look into the purchasing as well as the sales future can help management decide where to invest its dollars.

How Purchasing Helps

Thus purchasing can relieve research of administratve effort, assist in limiting non-productive new product development, and insure intelligent procurement from the start. It can screen research personnel from time-consuming non-productive interviews with vendors, while soliciting from these same vendors information helpful to many groups in the company. And it can help management determine where new capital should be put.

However, the buyer who works with research will require special training. In large companies, special positions may have to be created and staffed to provide technical liaison. But the costs of such training and staffing can be more than offset by the additional profits earned in the first months or years of a successful new product's life.

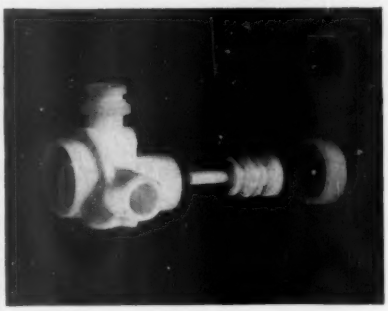
P.A.'s Legal Responsibility

(*Continued from page* 92)

bids everyone, who in a fiduciary relation has acquired information concerning or interest in the business or property of his associate or employer, from using that knowledge or interest to prevent the latter from accomplishing the purpose of the relation.

"If one ignores or violates this prohibition the law charges the interest or the property which he acquires in this way with a trust for the benefit of the other party to the relation, at the option of the latter, while it denies to the former all commission or compensation for his services.

(*Please turn to page* 192)



Purchase for Profit!

Specify Chicago Molded

These injection molded nylon shapes compose a unique Venturi valve unit used to regenerate the mineral bed of a Culligan Water Softener. Previously, they were brass. By switching to Chicago Molded thermoplastics, performance and durability were improved, material cost cut, machining and finishing eliminated. Your job may be smaller or very large, may require a different plastic, compression or transfer molding. To *purchase for profit, specify:*

CHICAGO MOLDED PRODUCTS CORPORATION
1028 North Kolmar, Chicago 51, Ill.

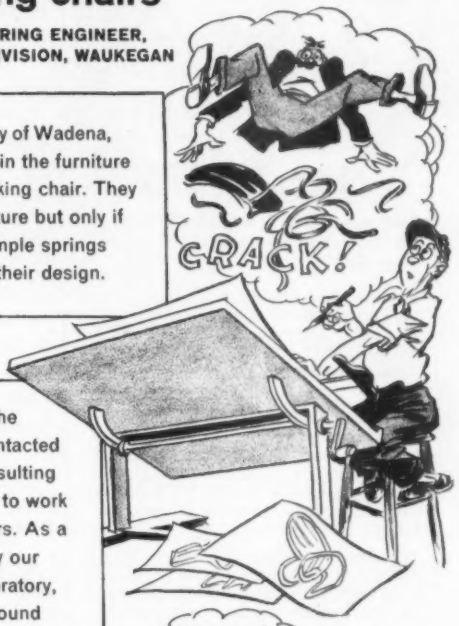
You get steel + plus from U.S. Steel



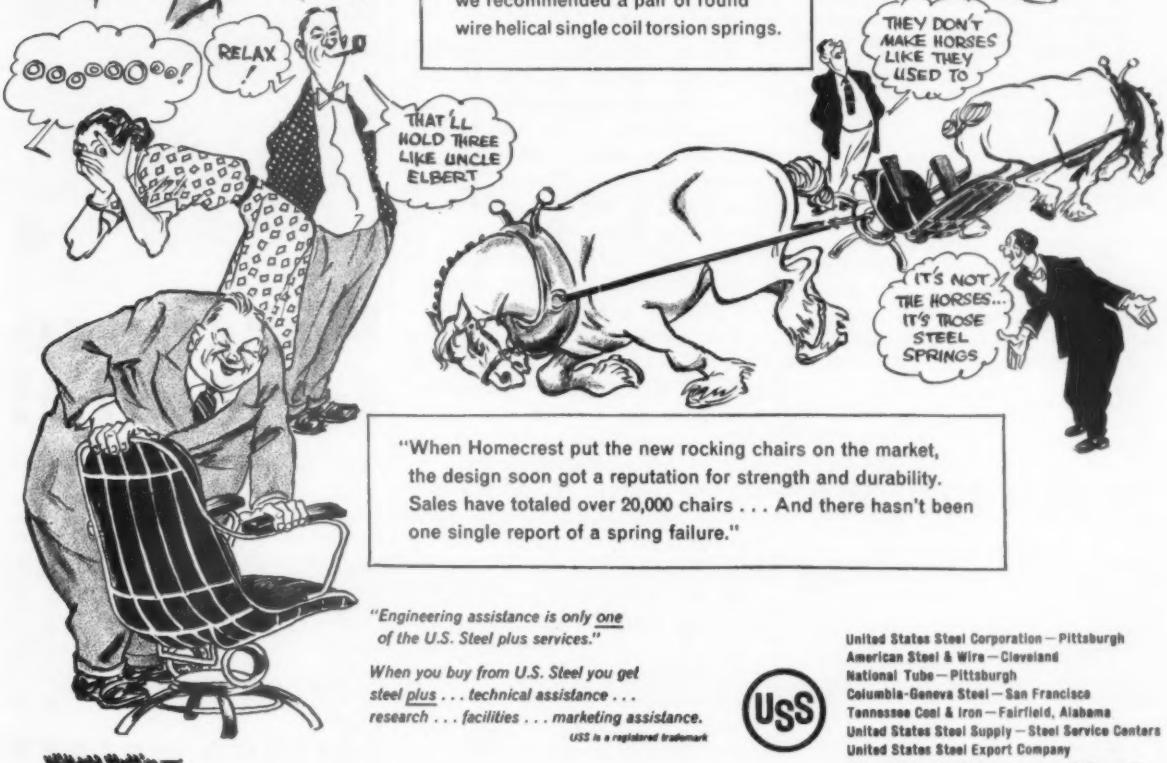
"Our steel spring recommendation helped sell 20,000 modern rocking chairs"

SAYS FRAN SMILEY, USS SPRING ENGINEER, AMERICAN STEEL & WIRE DIVISION, WAUKEGAN

"The Homecrest Company of Wadena, Minnesota, saw a place in the furniture market for a modern rocking chair. They wanted to make the venture but only if perfectly reliable and simple springs could be developed for their design.



"While the chair was still in the design stage, Homecrest contacted our Spring Engineering Consulting Service. Our engineers went to work with the Homecrest designers. As a result of many tests made by our Spring Fatigue Testing Laboratory, we recommended a pair of round wire helical single coil torsion springs.



"When Homecrest put the new rocking chairs on the market, the design soon got a reputation for strength and durability. Sales have totaled over 20,000 chairs . . . And there hasn't been one single report of a spring failure."

"Engineering assistance is only one of the U.S. Steel plus services."

When you buy from U.S. Steel you get steel plus . . . technical assistance . . . research . . . facilities . . . marketing assistance.

USS is a registered trademark

USS

United States Steel Corporation — Pittsburgh
American Steel & Wire — Cleveland
National Tube — Pittsburgh
Columbia-Geneva Steel — San Francisco
Tennessee Coal & Iron — Fairfield, Alabama
United States Steel Supply — Steel Service Centers
United States Steel Export Company

United States Steel



From raw material to finished product, she's the boss . . . on top of the job and directing every turn.

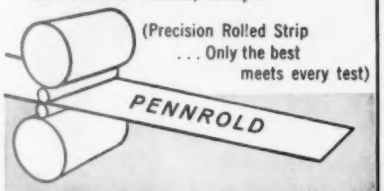
For the same reasons, nobody can provide as complete application and fabrication engineering service on PRECISION BERYLLIUM COPPER STRIP as the company who controls its quality in each step of manufacturing from raw ore to packaging of finished strip.

Whether your problem requires design assistance, development of manufacturing techniques, special heat treatment or any other processing information, call your nearest Pennrold Service Center for an experienced field engineer.

The Brush Beryllium Co. and its Pennrold Division offer you the world's most completely integrated facilities for the production of the finest precision beryllium copper strip rolled today. With it, you get complete application engineering service, the widest range of sizes (down to 0.0005" thick) and the largest coil size in the industry (for greater uniformity and faster delivery).

Complete application and fabrication engineering service is also available to users of precision rolled phosphor bronze and other special purpose alloy strip.

For more information, quotations, or fast delivery—call your nearest Pennrold Service Center, today!



THE BRUSH BERYLLIUM CO.

PENNROLD DIVISION
501 Crescent Avenue/Reading, Pennsylvania

Service Centers and Warehouses

Reading, Pa.— FRanklin 5-4361
Southington, Conn.— MArket 8-5574
New York, N. Y.— WAlker 5-7500 or Enterprise 6479
West Paterson, N. J.— CLifford 6-1085
Philadelphia, Pa.— MOhawk 4-6749
Pittsburgh & Cleveland— Cleveland, ENdicott 1-5400
Chicago, Ill.— GLadstone 5-7850
Detroit, Mich.— TUxedo 4-2530
St. Louis, Mo.— SHerwood 1-6423
Greensboro, N. C.— BRoadway 3-5973
Los Angeles, Calif.— PLeasant 3-5531

For More Information Write No. 289 on Inquiry Card—Page 32

P.A.'s Legal Responsibility

(*Continued from page* 190)

"This inexorable principle of law is not based upon nor conditioned by the respective interests of the parties to the relation, the times when that relation commences or terminates or the injury or damage which the betrayal of the confidence given, entails.

"It rests upon a better foundation, upon that sagacious public policy which, for the purpose of removing all temptation removes all possibility that a trustee may derive profit from the subject matter of his trust, so that one whose confidence has been betrayed may enforce the trust which arises under this rule of law although he has sustained no damage, although the confidential relation has terminated before the trust was betrayed, although he had no legal or equitable interest in the property and although the employer who acquired it had no joint interest in or discretionary power over it."

Quality, Service & Price

(*Continued from page* 86)

Cost of use

For raw materials, and supplies, cost of use is the delivered price of material consumed per unit of production that becomes a finished product, allowing for waste and scrap. This is the cost you have in mind when buying steel strip of the most economical width, or concentrated acid, or coal of high BTU content, or regular grade of gasoline.

For purchased machinery, the cost of use is the cost of power and the cost of labor for operation, plus the cost of raw materials and supplies consumed per unit of production that flows to finished product. You have this cost in mind in buying automatic high precision machine tools, a large capacity power shovel, a costly high pressure steam boiler, or a low priced automobile.

These are the tools of your profession, not quality, service, and price, but performance and costs. Add your judgment for right buying decisions. Result is bound to be top level purchasing for profit.

RAIL and TRACK ACCESSORIES

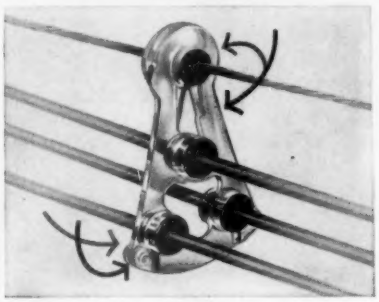


Get the advantage of "single-source" buying for all your needs in industrial track and crane runways. Prompt deliveries assured from the nation's largest warehouse stocks of rail, switch material, tools and construction products. Foster is national distributor to industry for major manufacturers, such as Weir-Kilby, Woodings-Verona, Nolan, Western Industries and others.

Refer to our catalogs in Sweet's File

L. B. FOSTER CO.
PITTSBURGH 30 NEW YORK 7 CHICAGO 4
HOUSTON 2 LOS ANGELES 5 ATLANTA 8

For More Information Write No. 290 on Inquiry Card—Page 32



Purchase for Profit!

Specify Chicago Molded

This new cable spacer, produced for PLM Products, Inc., is speeding installation time on messenger-supported aerial cable systems . . . cutting costs for service and utility companies. The unit locks in place automatically without tools or bolts—no extra pieces to handle or drop. A weather-resistant, extra strength acrylic material was recommended and a unique mold design permits injection molding all parts in a single shot. The resulting savings prove the importance of purchasing for profit . . . which is to say, "Specify CMPC."

CHICAGO MOLDED PRODUCTS CORPORATION
1028 North Kolmar, Chicago 51, Ill.

WELDCO

WELDCO

WELDCO

WELDCO

WELDCO

WELDCO

WELDCO

WELDCO

WELDCO

WELDCO

WELDCO

When you think of Pipe and Tubing think of...



THE ONLY PIPE and TUBING MADE WITH THE *Exclusive* DOUBLE-FUSION WELDING PROCESS

In every length of WELDCO Pipe and Tubing, you get quality, uniformity, dependability . . . because WELDCO is produced by specialists—men who have the experience, equipment and facilities to make Pipe and Tubing to your exact specifications.

WELDCO (and only WELDCO) is welded with the exclusive Double-Fusion process. It's available in Stainless Steel, Monel, Inconel, Nickel, Cupro-Nickel, Hastelloy, and Titanium, in Pipe and Tube sizes from 3" to 30", Schedules 5, 10, and 40. When you think of top-quality, dependable Pipe and Tubing, think of WELDCO. A letter or phone call puts our 30 years of specialized experience to work for you.

Whatever Your Needs in Tubing...
You're 'Way Ahead With WELDCO

WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3718 Oakwood Ave., Youngstown 9, O.

WELDCO

For More Information Write No. 291 on Inquiry Card—Page 32

Linear Programming

(*Continued from page 72*)

from hours back into quantities of parts to make and buy. This is given in Table III.

The plan calls for buying the total requirements of A's in the third and fourth quarters. All other requirements will be met by production on regular time with no overtime being used.

Some production for inventory will be required in the first half of the year. Twenty A's produced in the first quarter will be carried to meet demand in the second quarter. In the second quarter, 120 extra B's will be made to help satisfy demand in the third quarter.

The total cost of this plan is $626,360, a reduction of $63,580 from the cost of the first feasible program.

Stabilizing Employment

It is often desirable to consider other than the minimum-cost plan for reasons which have not been taken into account originally in formulating the problem. For example, if the plant is operating at about a 60,000 hours per quarter level prior to the beginning of the year, we may wish to avoid dropping to a 47,000-hour level for the first quarter only to rehire again in the second.

A minimum-cost plan with the added restriction that employment must be maintained at least at the 60,000 hour level may be obtained very simply. This can be accomplished by adjusting the original minimum-cost plan in such a way that the 13,000 unused regular make hours in the first quarter are eliminated with a minimum increase in total cost.

The resulting new program can be checked by crossing out the unused regular make hours squares in each quarter as impossible and then evaluating the unused squares to see if any improvement can be made.

Under the new, stable-employment plan, the plant will be operated at the 60,000 hours level throughout the year. An additional 130 A units will be made in the first quarter and purchases of A's will be reduced by 130 in the third quarter.

The net increase in combined costs of production, purchasing and carrying inventory resulting from this change would be $780.

More On Linear Programming

Dr. Smith's next article on linear programming and its relation to purchasing will deal with how to select a mix of raw materials to buy so that manufacturing requirements will be satisfied at minimum cost. Watch for it in the December 21 issue.



RITCO FORGINGS

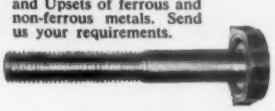
...best by any test!

Toughness to shock and stress is just one of the many features found in Ritco Forgings. While their dense, fibrous structure and controlled grain flow assure maximum impact resistance and fatigue strength, their smooth, highly accurate surfaces speed up assembly time, save hours of time and trouble. Made to close tolerance specifications, these finer forgings enable you to hold machining to a minimum . . . keep production costs down.

Plan to write Ritco into your product specifications the next time you need forgings. Made in a wide range of metals and alloys, and in many designs.

1934 * 1959 125th ANNIVERSARY

Ritco also offers complete machining facilities and makes Special Fasteners and Upsets of ferrous and non-ferrous metals. Send us your requirements.



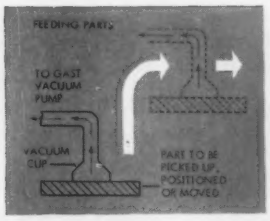
Send us your blueprints now for estimates at no obligation!

RHODE ISLAND TOOL COMPANY

Member Drop Forging Association

150 WEST RIVER STREET • PROVIDENCE 1, R. I.

For More Information Write No. 292 on Inquiry Card—Page 32





NEW

Gast Booklet ready to give you

"APPLICATION IDEAS"

on uses of air motors, compressors, vacuum pumps

Looking for new ways to improve methods—save time—or cut costs? This booklet may be valuable to you! With line drawings, it shows dozens of the basic principles of "putting air to work".

With photographs of our customers' products—from air mixers to data plotters—it illustrates each principle. . .and shows how Gast rotary Air Motors, Compressors and Vacuum Pumps provide advantages as original equipment or in plant use.

Design Engineer or Plant Master Mechanic, you'll find this booklet of interest. . .and it may "spark" an important idea you can use!

WRITE TODAY FOR NEW "APPLICATION IDEAS" BOOKLET!

Gast Manufacturing Corp.
P.O. Box 117 -K
Benton Harbor, Mich.

GAST ROTARY
• AIR MOTORS TO 7 H.P.
• COMPRESSORS TO 30 P.S.I.
• VACUUM PUMPS TO 28 IN.
"Air may be your answer!"

For More Information Write No. 293 on Inquiry Card—Page 32



rugged
compact
easy-to-use

Zeiss-Kollmorgen Borescopes

Precision manufactured for detailed inspection of tubes, tanks, cavities, injectors, pipes, cylinders, gun bores

Designed in sizes and models for every job. Diameters from .100", lengths to 45 feet or longer. Self-illuminated. Choice of viewing heads for different angles of observation. See how these versatile instruments can increase inspection efficiency. Adaptable for photography. Write for Bulletin 305.

KOLLMORGEN
optical corporation
NORTHAMPTON, MASSACHUSETTS

For More Information Write No. 294 on Inquiry Card—Page 32



The Sylvania bearing junction box used by the U.S. Navy for radar control and electrical firing.

Call on Alcoa's Jobbing Division!

When Sylvania needed "custom service" for bearing junction boxes, they called on the completely equipped engineering department of Alcoa's Jobbing Division. Alcoa engineers worked with Sylvania on the design and engineering of this job. Then, Alcoa production specialists took over and handled 100 per cent of the tooling and fabricating. Changes kept coming even after production began, but the quality of finished units was rated excellent. For any phase of product design or engineering, use the complete facilities and expert staff available to you at Alcoa's Jobbing Division. See your nearest Alcoa sales office for information today!

FREE TO MANUFACTURERS—16-page booklet. In addition to design and engineering, Alcoa's Jobbing Division has the world's finest aluminum fabricating facilities for subcontracting to your order any aluminum components for anything you make. This 16-page booklet describes how these facilities can save you tooling-up costs, lighten your production load and generally cost less than if you shouldered the whole job yourself. For your copy, write or clip and mail the coupon.

Your Guide to the Best in Aluminum Value

ALCOA ALUMINUM

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

ALUMINUM COMPANY OF AMERICA
1868-M Alcoa Building, Pittsburgh 19, Pa.
Please send my free copy of *Alcoa Aluminum Fabricating Facilities.*

NAME _____ TITLE _____
COMPANY _____
STREET ADDRESS _____
CITY _____ ZONE _____ STATE _____

For More Information Write No. 295 on Inquiry Card—Page 32

New MARSH "Master-Test" SERIES

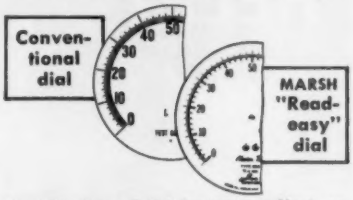


Twin-tip pointer enables observer to read "dead-on" by lining up twin tips like gun sight.

Unprecedented accuracy and dependability in test gauges developed to meet today's exacting requirements. Each gauge individually *dead-weight tested!* Guaranteed accurate within ¼ of 1% plus or minus of maximum dial reading over entire range.



Mirror dial also insures accurate "dead-on" reading.



New "Read-easy" dial (patent pending), as illustrated above, assures reading accuracy in keeping with indicating accuracy. Also note three advanced means of reading available in all "Master-test" gauges: twin-tip pointer, mirror dial, and "non-parallax" dial as shown opposite.

Sizes 4½", 6", 8". All standard pressure ranges 0-15 psi to 0-30,000 psi, vacuum and compound.



"Non-parallax" dial has Plexiglas insert that assures accurate reading even when read at angle.

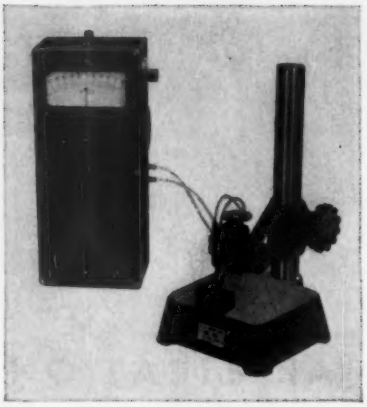
Ask for new 20 page bulletin covering all details

MARSH INSTRUMENT CO., Dept. G, Skokie, Ill
Division of Colorado Oil and Gas Corporation
Marsh Instrument & Valve Co., (Canada) Ltd.
8407 103rd St., Edmonton, Alberta, Canada
Houston Branch Plant, 1121 Rothwell St.,
Sect. 15, Houston, Texas

For More Information Write No. 296 on Inquiry Card—Page 32

MODEL AG5 ACCU-FLOW AIR GAUGE

A general-purpose non-contact gauge for use as measurer or comparator on a variety of critical applications.



A new standard of accuracy...

ACCU-FLOW* by AMES

B. C. Ames has perfected a new concept of air gauging that offers extremely fine measurement and unusual stability.

AMES ACCU-FLOW air gauges give you an accurate non-contact measuring method that is ideally suited to checking size variations on continuous production items such as wire, rubber, plastics, etc. Send for free ACCU-FLOW folder.

*Trademark of B. C. Ames Co.

Representatives in Principal Cities



B.C. AMES CO.

31 Ames Street, Waltham 54, Mass.

Canadian Representative—H. C. Burton Co. Ltd., Hamilton

MANUFACTURERS OF MICROMETER DIAL INDICATORS AND GAUGES

For More Information Write No. 297 on Inquiry Card—Page 32

TUBULAR FABRICATING & FINISHING

NICKEL CHROME PLATING
PAINTED FINISHES

from design to finished product

INDUSTRIAL · AUTOMOTIVE · FURNITURE

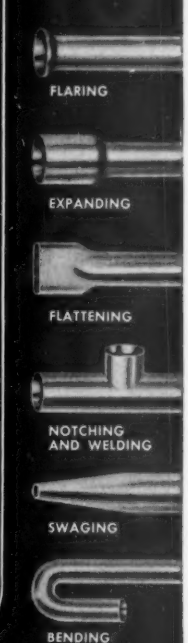
One of the nation's largest integrated tubular metal forming operations under one roof

• Tube mills • complete fabricating • automatic plating • electrostatic painting • Strict conformance with specifications, unlimited production capacity, competitive pricing, swift delivery.

Our engineering department is available to help you with the design of your tubular component parts.

NATIONAL

Send for full information.



NATIONAL *Metalwares* INC.

603 SPRUCE STREET, AURORA, ILLINOIS

For More Information Write No. 298 on Inquiry Card—Page 32

GET MORE OUT OF PURCHASING

Put your own name on the mailing label that delivers PURCHASING Magazine . . . and see how much more you'll get out of the contents.

See how much you'll gain by having time to really digest the material written just for you.

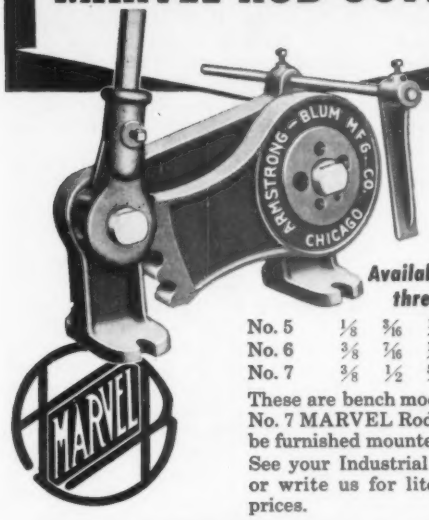
A personal copy should always be handy for easy reference—ready to help you when you need it.

Order a personal subscription now—$4. a year. Write to PURCHASING Magazine 205 E. 42nd Street, New York 17, N. Y.

Just a single stroke!...

CUTS ROUND RODS ⅛" to ⅞" on a

MARVEL ROD CUTTER



Available in three models:

No. 5	⅛	3/16	¼	5/16	⅜
No. 6	⅜	7/16	½	9/16	⅝
No. 7	⅜	½	⅝	¾	⅞

These are bench models, but the No. 7 MARVEL Rod Cutter can be furnished mounted on legs. See your Industrial Distributor or write us for literature and prices.

ARMSTRONG-BLUM MFG. CO.

5700 W. Bloomingdale Ave. • Chicago 39, U.S.A.

Manufacturers of the outstanding MARVEL Metal Saws.

For More Information Write No. 299 on Inquiry Card—Page 32



For More Information Write No. 300 on Inquiry Card—Page 32

To Your DESIGN SPECIFICATIONS- From the Hand of the Specialist . . .

ERIE

Bolts • Studs • Cap Screws • Nuts

in Alloys • Stainless • Carbon • Bronze



Experienced hands . . . expert hands . . . hands grown competent by the finest of precision work since 1913. These are the hands of our specialists who meet your design and engineering specifications. Special and Standard Erie fasteners to meet the rigors of extreme temperatures, corrosion, tensile, fatigue, impact and shear stresses are serving widely diverse industries the world over. We work to Government and National specs and to special applications as well. Send your specifications to us, confident of the finished precision fasteners you expect.

A SUBSIDIARY OF
RIC
REPUBLIC INDUSTRIAL CORPORATION

ERIE BOLT & NUT CO.

Erie, Pennsylvania

Representatives in Principal Cities

For More Information Write No. 301 on Inquiry Card—Page 32

Employment Service

Experience: Twenty years of purchasing. Last fourteen purchasing agent with very large Automotive Parts Manufacturer. All phases of purchasing function. Military procurement during World War II.
Education: Several purchasing courses plus metallurgy in college.
Will relocate: Detroit Area preferred.
Write: Box 488

Experience: Twenty years extensive purchasing agent experience with major construction firms, in the petrochem industries, including the rental of equipment, issuing of sub-contracts, supervision of expediting and material control, and warehousing & receiving depts. under my supervision. A past member of N.A.P.A., 5 years as an Air Force Procurement Officer. Know both domestic & foreign buying, speak and write Spanish.
Education: BA mech. engrg. Post graduate work in bus. adm. Special courses in purchasing & management.
Will relocate.
Write: Box 483

Experience: Seventeen years in the purchasing of all types of steel, castings, lumber, packaging, dies, tools and MRO supplies. Interested in a position as purchasing agent. Heavy administrative and management background. Long experience in all phases of management with tool manufacturer.
Education: Home study courses.
Will relocate.
Write: Box 482

Experience: Eleven years materials supervisor, senior buyer, materials coordinator and contract administrator for general contractor doing refinery, petrochem, and power plant construction. Exceptional knowledge of materials, material procurement, expediting, and warehousing. Three years experience.
Education: Majoring in business.
Will relocate.
Write: Box 468

Experience: Five years as purchasing agent in automotive and electronic field. 16 years previous in sales and production management. Experience in material and inventory control.
Education: Completed full courses in production management, material handling and inventory control, motion & time study, bookkeeping fundamentals.
Will relocate.
Write: Box 469

Experience: Six years purch. agent food & meat processing co. All phases of purchasing, including contract procurement & dep't. head. Experienced traffic, expediting, receiving & material control. Originated machine methods of controls. Experienced in procurement of all types of materials, equipment & machinery.
Education: CH-E, & bus. adm. Majors.
Will relocate.
Write: Box 486

Experience: Two years warehouse superintendent. Nine years asst. purchasing agent for large coal corporation & experience in mechanized inventory control, expediting and all phases industrial purchasing including large capital expenditures.
Education: B. S.
Will relocate: Prefer west coast or south
Write: Box 487

Experience: Eighteen years extensive purchasing experience all phases of procurement, policy and administration of single and multi-plant operation with steel, fabrication and manufacturing, heavy construction and shipbuilding background in big business.
Education: B.A. degree—Job and management instruction training. Work simplification and personnel relationship. Purchasing procedures.
Will relocate.
Write: Box 460

HOW TO APPLY

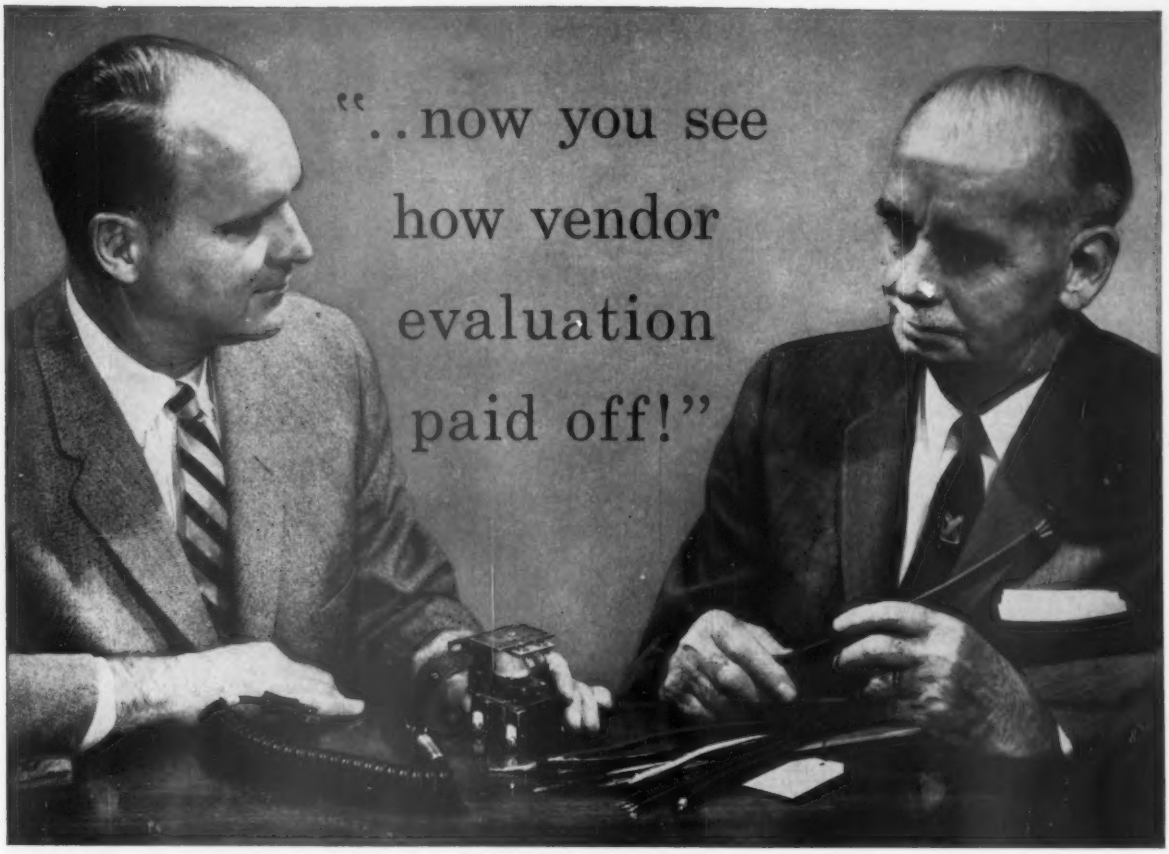
Listings in this department are offered without charge. Both purchasing department personnel interested in changing jobs and employers in search of replacements or additions to their departments may take advantage of this service. When writing, specify whether you want the applicant's form or the employer's form. Address all correspondence—whether for forms, or in answer to an employment advertisement, to: Box No., Employment Service Department, PURCHASING Magazine, 205 East 42nd Street, New York 17, New York.

Experience: Asst. P.A. for can co. directing buying for seven mills. Formerly buyer for U. S. S. Corp. handling twelve mills. In both capacities I purchased capital equip., raw matls., mill supplies castings, electrical equip., and shipping materials. Completely familiar with production and operating purchasing function.
Education: Two years university, continuing nights for a degree in purchasing. Completed a course in purchasing law.
Will relocate.
Write. Box 489

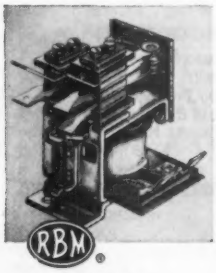
Experience: Purchasing Agent: Twenty years experience in chemical and allied industries. Administrative experience with both line and staff authority. Wide knowledge chemical raw material procurement. Also experience purchasing machinery, equipment and MRO supplies. District chairman, Value Analysis-Standardization Committee, N.A.P.A. Member nominating Committee, local P.A.A.
Education: B.S. degree in chem. engrg. from Mass. Inst. of Tech.—Two Years New York Univ. Law School.
Will relocate.
Write: Box 490

Experience: Twenty yrs. with U. S. Government. Nine years in procurement, contracting & negotiating of automotive, small boats, furniture, shop equipment and tools. Set up requirements & budget for this material; 1-year in production of aircraft; 2-yrs. in property accounting systems; 1-year as business manager overseas with responsibility of over-all direction of procurement activities & development of proper procurement methods; 7-yrs. in supply management, surveying and establishing improved systems in purchasing, contracting, inventory controls, shipping, receiving, traffic, etc. Have knowledge of ADP system for inventory control and procurement. Salary Range—$12,000 per annum.
Education: 4½ years accounting. Completed economics of national security course in Industrial College of the Armed Forces.
Will relocate.
Write: Box 485

Experience: Ten years experience; purchasing, inventory control, stores, traffic & salvage, for industrial plant. Varied procurement experience including raw materials, contracts, fabrication, M&E & supplies. Responsible for setting up purchasing dept., inventory control, stores & receiving including all procedures & forms for new plant. Also experience in accounting and cost controls.
Education: 3½ years bus. admin.—marketing major.
Wil relocate.
Write: Box 484



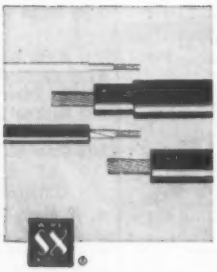
... Controls, Cord Sets, Wire and Cable All from Essex Single Source



RBM Relays

Low cost, high quality relays: general purpose, open and hermetically sealed, motor starting, AC industrial contactors and starters for Communications, Electronic and Appliance Industries.

R-B-M Controls Div., Logansport, Ind.



SX Wire and Cable

A complete line of appliance wiring material, radio, television and electronic hook-up wire, 200°C high temperature Sil-X wire, automotive wires and cables, and flexible cords.

Wire and Cable Div., Fort Wayne, Ind.



Coiled Cords, Cord Sets

Plastic and rubber power supply cords. Terminations of all types (molded plastic and rubber). Complete line of Coiled Cords in HPN, Type SP and Types SV, SJ; covering full appliance range.

Cords Limited Div., DeKalb, Illinois

Across the board—Essex Single Source Service pays off! It's a sensible approach to reduction of finished product costs. Close quality control is reflected in absence of reject problems and tight production schedules are maintained as a result of dependable Essex delivery of integrated electrical components.

Learn how Essex Single Source Service can work to your advantage. Call your local Essex application specialist today for details on this practical component purchasing plan!

ESSEX SINGLE SOURCE

SX WIRE PRODUCTS

ESSEX WIRE CORPORATION
Fort Wayne, Indiana

For More Information Write No. 302 on Inquiry Card—Page 32

Advertisers In This Issue

A

Acme Visible Records, Inc. 166
Aeroquip Corp. 153
Air Reduction Sales Co. & Subsidiaries 186
Alan Wood Steel Co. 59
Allen Mfg. Co. 180
Allmetal Screw Products Co., Inc. 178
Aluminum Company of America 26, 151, 195
American Brass Co., The 39
American Felt Company 24
American Pulley Company, The 32
American Steel Warehouse Assn. 106
American Telephone & Telegraph Co. 120
Ames Co., B. C. 196
Anaconda Copper Mining & Subsid. Cos. 39
Arabol Mfg. Co., The 179
Armstrong-Blum Manufacturing Company 197
Avery Label Company 127

B

Bassick Co., The 202
Bay West Paper Co. 126
Bearings, Inc. 182
Black & Decker Mfg. Co. 158, 159
Borroughs Mfg. Co. Subsidiary Amer. Metal Prod. Co. of Detroit 114
Bound Brook Oil-Less Bearing Company 177
Bridgeport Brass Co. 34, 35, 66
Brown Lipe Chapin Division of General Motors Corp. 43
Brown Paper Co., L. L. 168
Bunting Brass & Bronze Company, The 134

C

Cambridge Wire Cloth Company, The 36
Campbell Chain Co. 146
Capewell Manufacturing Co., The 60
Catawissa Valve & Fittings Co. 126
Century Electric Company 1
Chicago Molded Products Coproration —Custom Molding Division.....190, 192
Chicago Rawhide Mfg. Co. 3
Cincinnati Milling Machine Co. 18
Clark Equipment Co., Industrial Truck Division 113
Cleveland Container Co., The 104
Conover-Mast Purchasing Directory.... 169
Continental Can Company 29
Continental Diamond Fibre, Div. of the Budd Co., Inc. 52, 53
Copperweld Steel Co., Ohio Seamless Tube Division 22
Cords Limited Div., Essex Wire Corp. 199
Crane Company 8
Crossett Paper Mills 107
Crucible Steel Company of America 136, 137, 181

D

De Laval Steam Turbine Co. 152
Detroit Stamping Company 188
Disston Division, H. K. Porter Company, Inc. 139
Dodge Mfg. Corp. 130, 131
Driver Harris Co. 173
Du Pont De Nemours & Co., Inc., E. I., Photo Products Div. 48

E

Emery Air Freight Corp. 129
Erie Bolt & Nut Company 197
Essex Wire Corp., R-B-M "Control" Div., Wire & Cable Div., Cords Limited Div. 199
Esterbrook Pen Co., The 164

F

Fafnir Bearings Co. 56
Ferry Cap & Set Screw Company, The 141
Fischer Special Mfg. Co. 110
Flexo Products, Inc. 197
Fort Howard Paper Co. 111
Foster Co., L. B. 192

G

Gast Mfg. Corp. 195
General Electric Company
Apparatus Sales Division 6, 115, 132, 133
Metallurgical Products Dept. 62
Wiring Device Dept. 50
Goodyear Tire & Rubber Co., Inc. 10
Graybar Electric Co., Inc. 4
Gries Reproducer Corp. 118

H

Hamilton Foundry Inc. 25
Hammermill Paper Co. 167
Handy & Harman 201
Hardinge Brothers, Inc. 23
Hoover Ball & Bearing Company....96, 97
Hubbell, Inc., Harvey, Machine Screw Dept. 190
Hyatt Bearing Div., General Motors Corp. 28
Hy-Pro Tool Company 144

I

Illinois Tool Work, Sems Licensee, Shakeproof Division 51
Ingersoll-Rand Company 54
Inland Steel Co. 14
International Business Machines 161
International Paper Co.
Fine Paper Division 165
Southern Kraft Division 40

J

Jeffrey Manufacturing Company 157
Jenkins Bros. ..... 4th Cover
Jobbins, Inc., William F. 156

K

Keasbey & Mattison Company 33
Kollmorgen Optical Corp. 195

L

Laminated Shim Co., Inc. 138
LaSalle Steel Co. 37
Lavelle Aircraft Corporation 46
Lincoln Electric Co. 183

M

Malleable Castings Council 124, 125
Marsh Instrument Co. Division of Colorado Oil & Gas Corp. 196
McLouth Steel Corp. 185
Milford Rivet & Machine Co. 65
Moore Business Forms 162, 163
Morse Chain Co. 112
Mt. Vernon Die Casting Corp. 143

N

National Acme Co., The 41, 99
National Carbon Company—Division of Union Carbide Corporation 117
National Machine Products Company.. 156
National Metalwares, Inc. 196
Newark Wire Cloth Co. 61
Nicholson File Co. 58

O

Ohio Seamless Tube Division of Copper Weld Steel Co. 22
Olin Mathieson Chemical Corp., Aluminum Division 93

P

Parker-Kalon Div. General Amer. Trans. Corp. 123
Penrold Div., of Brush Beryllium Co., The 192
Philadelphia Quartz Company 176
Pioneer Rubber Company—Industrial Division 189

Q

Quaker State Metal Co. 30

R

R-B-M "Control" Div., Essex Wire Corp. 199
Republic Steel Corporation 170, 171
Revere Copper & Brass, Inc. 187
Reynolds Metal Company 20
Rhode Island Tool Company 194
Rochester Products Division of General Motors Corp. 63
Rollway Bearing Company 140
Royal Metal Manufacturing Company 166
Ryerson & Son, Inc., Joseph T. 68

S

St. Regis Paper Co., Panelyte Division 154, 155
Scott Paper Company 105
Sharon Steel Corp. 121
Shell Oil Company .....2nd Cover
Signode Steel Strapping Co. 12
Socony Mobile Oil Co., Inc. 102, 103
Spaulding Fibre Co., Inc. 145
Square D Company .....3rd Cover
Standard Pressed Steel Company 128
Steiner Company 142
Studebaker Packard Corp. 147
Sugar Beet Products 184
Superior Tube Co. 2
Sylvania Electric Products, Inc. 55
Synthane Corp. 119

T

Taylor Fibre Co. 100
Thermoid Division, H. K. Porter Company, Inc. 135
Tinnerman Products, Inc. 49
Titeflex Inc. 16
Tomkins-Johnson Co. 122
Trent Tube Company 181

U

Udylite Corp. 64
Union Steel Corp. 42
United States Rubber Co. 101
United States Steel Corporation 191

V

Vascoloy-Ramet Corp. 116

W

Wagner Electric Corp. 38
Wales-Strippit Co. 150
Wellington Sears Company 31
Westinghouse Electric Corp., Apparatus Division 108, 109, 148, 149
Whitman & Barnes Division of United-Greenfield Corp. 45
Wilton Tool Mfg. Co., Inc. 118
Wire & Cable Div., Essex Wire Corp. 199

Y

Yale & Towne Mfg. Co. 175
Youngstown Sheet & Tube Co. 47
Youngstown Welding & Engineering Co., The 193

Purchasing

205 East 42nd Street, New York 17, N. Y.
MUrray Hill 9-3250

Ray Richards ..... Publisher
Alex G. Graam .....Assistant Publisher
Joseph T. McCourt .....Sales Manager
Hugh Robinson .....Eastern Regional Mgr.
Jack Morris .....New York
John Donlon .....New York
Thomas F. Hannon Mid-west Regional Mgr.
Ed Crilly .....Chicago
C. D. Francisco .....Chicago
C. R. Kingsley .....Western Regional Mgr. Los Angeles
Ellsworth Brown Central Regional Mgr., Pittsburgh
Robert Hawley .....District Mgr., Cleveland
Jack T. Steelman .....District Mgr., Detroit
Wayne Slockbower .....Promotion Manager
Roy Hubbard .....Mgr. Circulation Service
Irene Kreidler .....Mgr. Advertising Service
Lucy D'Elia .....Advertising Production

BRANCH OFFICES

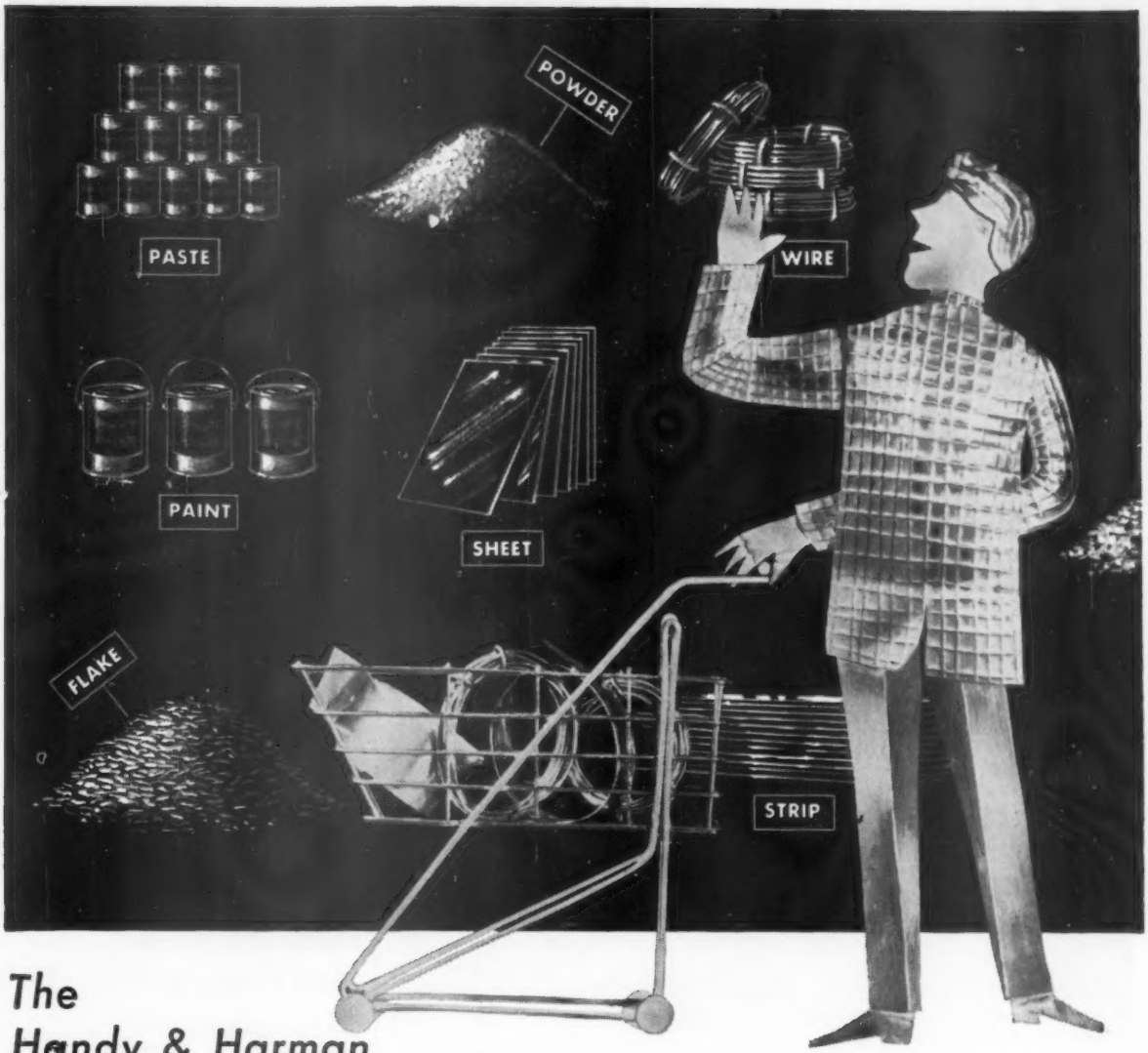
737 North Michigan Avenue ...Chicago, 11, Ill.
3101 Euclid Avenue .....Cleveland 15, Ohio
864 So. Robertson Blvd. ..Los Angeles 35, Calif.
868 National Press Building Washington 4, D.C.
15817 James Couzens Highway..Detroit, Mich.
601 Grant St. .....Pittsburgh, Pa.

Published by
CONOVER-MAST PUBLICATIONS, INC.

B. P. Mast, Sr. .....Chairman of the Board
B. P. Mast, Jr. .....President
Ray Richards .....Vice President
A. M. Morse, Jr. .....Vice President
A. H. Dix .....Vice President, Research
Harvey Conover, Jr..Vice President & Secretary
Leo Haggerty .....Treasurer
John T. Dix ...Director of Mid-West Operations
L. E. McMahon .....Production Manager
Daniel G. Smith .....Circulation Manager

NBP BPA

Conover-Mast Publications
Purchasing
Mill & Factory • Space/Aeronautics
Construction Equipment
Electrical Manufacturing
Volume Feeding Management
Business/Commercial Aviation
The Boating Industry
Conover-Mast Purchasing Directory



The
Handy & Harman

Silver Supermarket

Has every form of silver for your electronics applications

Silver, in many forms and alloys, is a necessity in the electronics and electrical industries. To meet this need on a high quality level, Handy & Harman manufactures powder, flake, paint, paste, sheet, strip, wire, etc., for printed circuits, wiring, resistors, condensers, thermistors, contacts, printed terminal strips on glass, ceramics, plastic laminates, etc.

Another "At Your Service" Division of the Handy & Harman Silver Supermarket is our Research and Engineering Department. Always ready to help you with any problem or project you may have involving silver for *any* application.

VISIT OUR BOOK DEPARTMENT

We have five Technical Bulletins giving engineering data on the properties and forms of Handy & Harman Silver Alloys. We would like you to have any or all of those that particularly interest you. Your request, by number, will receive prompt attention.

Fine Silver	**Bulletin A-1**
Silver-Copper Alloys	**Bulletin A-2**
Silver-Magnesium-Nickel	**Bulletin A-3**
Silver Conductive Coatings	**Bulletin A-4**
Silver Powder and Flake	**Bulletin A-5**

Your No. 1 Source of Supply and Authority on Precious Metal Alloys

HANDY & HARMAN

General Offices: 82 Fulton St., New York 38, N. Y.

For More Information Write No. 303 on Inquiry Card—Page 32

MATERIALS-HANDLING NEWS

NEW AND UNUSUAL APPLICATIONS OF BASSICK CASTERS THAT MIGHT BE ADAPTED TO YOUR HANDLING PROBLEMS

Jantzen tries "new kind" of caster... eliminates 98% of wheel replacements

Maintenance and materials handling men at Jantzen, Inc., manufacturers of beach and sportswear in Portland, Oregon, have solved a handling problem common to many concerns with buildings spread out over a sizeable area.

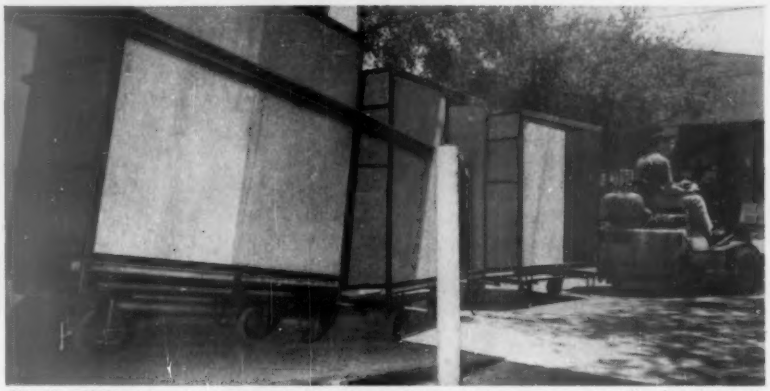
They did it by putting Bassick Floating Hub casters on transport trucks towed in trains of two to six units by power trucks for inter-building service.

Almost immediately, trucks equipped with Floating Hub casters stopped showing up on maintenance and replacement records. After five years of continuous service only 3 out of more than 160 Floating Hub casters have had to be replaced. Standard caster previously used had required replacement after 6 to 8 months.

Truck trains move at up to 15 mph over rough asphalt roadways. With Bassick Floating Hub casters, however, casters last longer, and wear and tear on trucks and roadways is greatly lessened.



Behind this dramatic product, Jantzen beachwear, is an almost equally dramatic story of materials handling: caster replacement cut 98%.



Floating Hub casters on power-pulled trucks got trial run 5 years ago . . . are still going strong at Jantzen, Inc. Life of caster used previously: 6-8 months.

Case Hardened Casters

At Bassick 6 heat treating furnaces, other modern equipment, housed in a special department, handle approximately 5,000,000 pounds of heat treated work per year. Ball races and other parts of Bassick casters are case hardened to increase life under heavy loads, prevent wear in ball bearings. One more reason Bassick casters roll longer.





Another Caster for Minimum Maintenance

Bassick Grooved wheel casters operating on inverted angle iron tracks require minimum maintenance provide maximum efficiency. Wherever materials must move often over same route, consider an inexpensive track set up and Bassick Grooved Wheel casters. Grooved Wheel casters operate both on and off tracks—provide positive control of loads.

Fragile Product—No! Shock Absorbing Caster—Yes!



Many companies handling materials which are not delicate, fragile nor breakable are turning to Bassick Floating Hub casters. Why? Shock absorbing construction equips these casters for extremely rough service in power pulled applications. As a result, maintenance and replacement of casters, trucks, floors or roadways is drastically reduced.

Where to Call

A local Bassick distributor is able and willing to help you. Call him in when you need casters and wheels. 9.30

THE BASSICK COMPANY
BRIDGEPORT 5, CONN.
IN CANADA;
BELLEVILLE, ONT.

see our catalog in Sweet's or write for copy

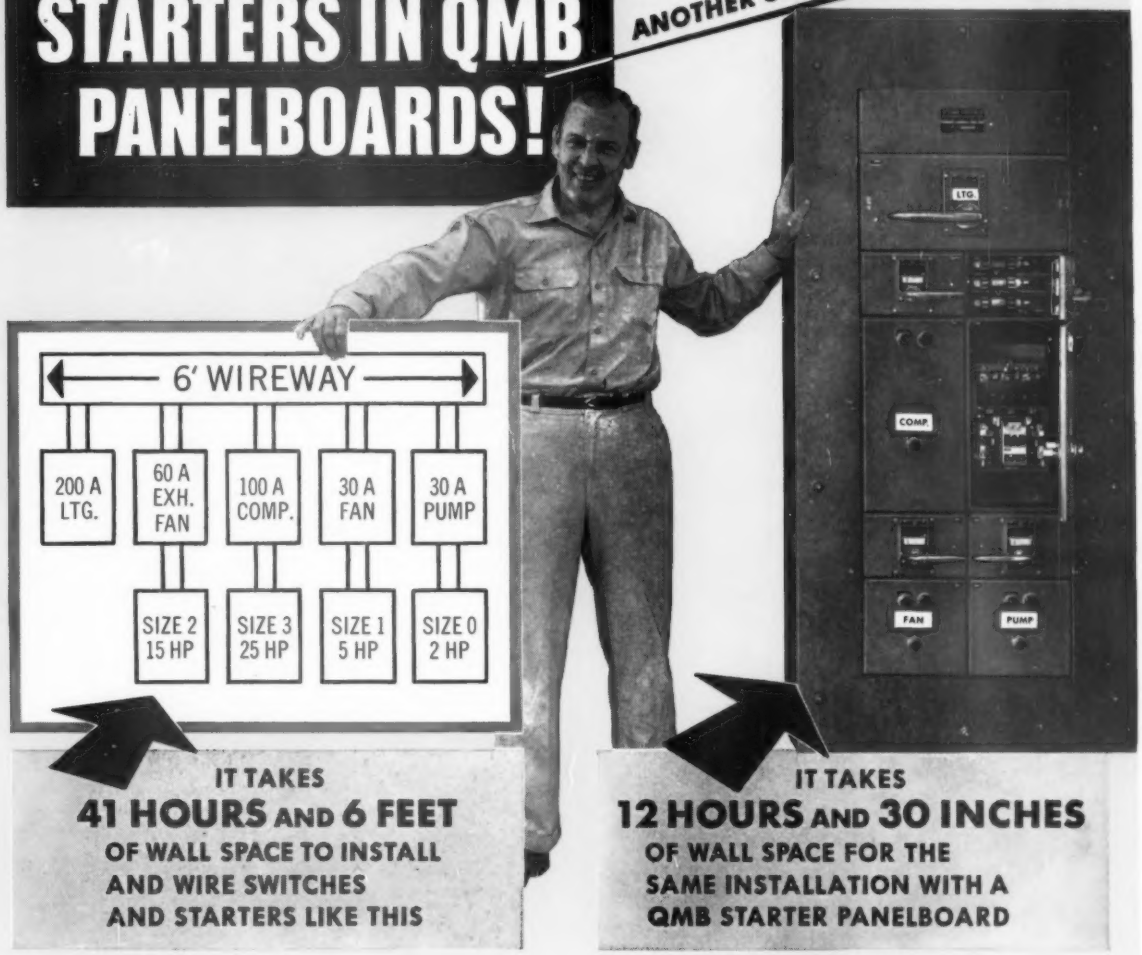
Symbol of SW Excellence

Bassick
A DIVISION OF
STEWART-WARNER CORPORATION

For More Information Write No. 304 on Inquiry Card—Page 32

STARTERS IN QMB PANELBOARDS!

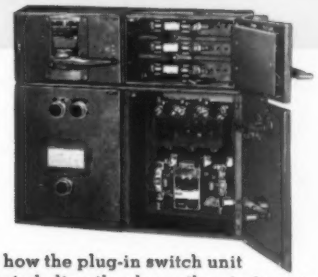
ANOTHER SQUARE D FIRST!



IT TAKES
41 HOURS AND 6 FEET
OF WALL SPACE TO INSTALL AND WIRE SWITCHES AND STARTERS LIKE THIS

IT TAKES
12 HOURS AND 30 INCHES
OF WALL SPACE FOR THE SAME INSTALLATION WITH A QMB STARTER PANELBOARD

Why mount separate starters and disconnect switches? It costs extra money. It wastes space. It takes a lot more time. QMB Starter Panelboards give you a *safer* installation because you can't open a starter when the switch is ON. They give you a much *better looking* job. Since they can even be *flush* mounted, they offer a lot more installation *flexibility*. QMB panelboards accommodate reversing and non-reversing starters, sizes 0 through 3. QMB switchboards and unit substations handle sizes 0 through 5. All of them are available, factory-assembled and wired. Or get enclosures, starters and plug-in switch units from your Square D distributor for on-the-job assembly.

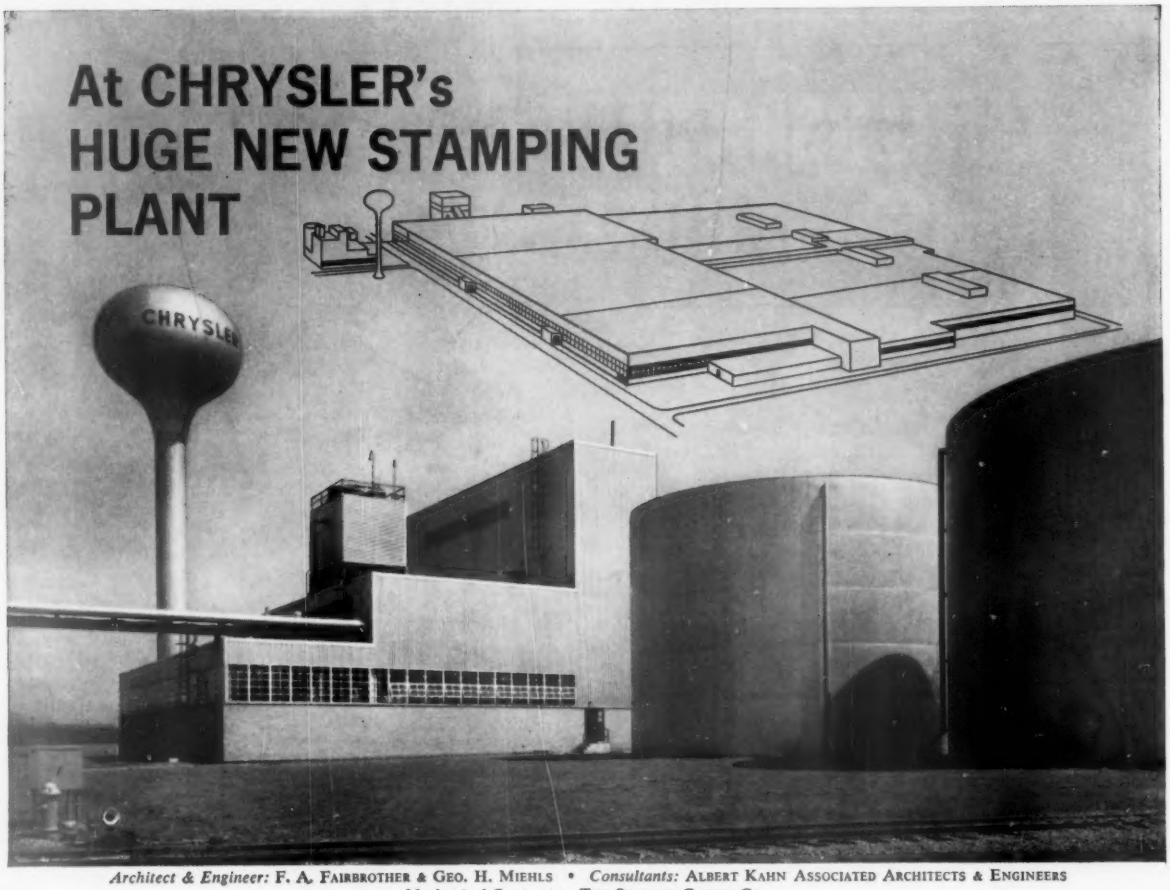


Notice how the plug-in switch unit is mounted directly above the starter, permitting interlocking. The starter cannot be opened when the switch is in the "ON" position.

It's easy to order these starter and switch units. See Page 57 in your Square D Digest and order from your distributor.

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY



Architect & Engineer: F. A. FAIRBROTHER & GEO. H. MIEHLS • *Consultants:* ALBERT KAHN ASSOCIATED ARCHITECTS & ENGINEERS
Mechanical Contractor: THE STANLEY CARTER CO.

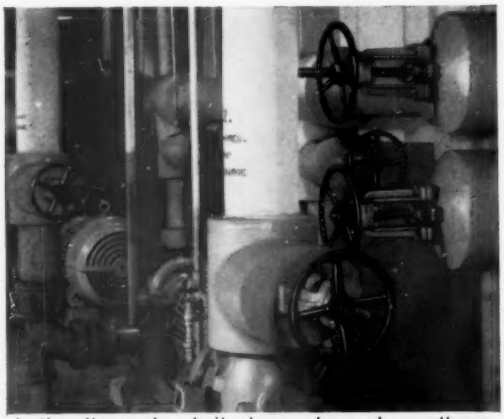
JENKINS VALVES assure reliable, economical control of Production's Lifelines

Cited as one of the nation's "Top Ten Plants of the Year", Chrysler Corporation's stamping plant at Twinsburg, Ohio, is a 34-acre model of building and manufacturing efficiency.

Go into the power plant and you will find Jenkins Valves everywhere, controlling "production's lifelines" that supply 150,000 pounds of steam per hour . . . 30 million cubic feet of air per day . . . 7500 gallons of cooling water per minute. Jenkins Valves got the job because "every effort was made to install the finest mechanical and electrical equipment . . . and to insure minimum costs by eliminating excessive upkeep and equipment with a short life span".

It is a highly significant fact that all building experts and operating engineers agree *"there's nothing better than Jenkins Valves"*. Many will always insist on JENKINS for critical services, and will prefer them for general use. After all, Jenkins Valves cost no more!

When you are buying or specifying valves, remember that the best valves are the best assurance of economical service. Jenkins Bros., 100 Park Ave., New York 17.



In the ultra-modern boiler house shown above, all general service valves controlling pipelines are JENKINS

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES
JENKINS SINCE 1864
Jenkins Bros

Sold Through Leading Distributors Everywhere

For More Information Write No. 153 on Inquiry Card—Page 32